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ORIGINAL COMMUNICATIONS.

Digestion of Albumen and Flesh, and the comparative Anatomy and Physiology of the Pancreas. By JOSEPH JONES, M. D., of Georgia.

The process of digestion has been the subject of numerous careful and laborious investigations, since Spallanzani first demonstrated it to be a chemico-physical process, and after the researches of Spallanzani, Magendie, Tiedeman, Gmelin, Prout, Beaumont, Mulder, Dumas, Liebig, Blondot, Bernard, Lehmann, Bidder and Schmidt, and many others, it seems impossible that it should still remain in obscurity. It has been the unanimous opinion of all physiologists, that flesh and the protein bodies generally were digested entirely in the stomach. Recently, however, this fact has been denied by physiologists of the highest authority. By recent experiments, Bidder and Schmidt have convinced themselves that one of the important offices of the intestinal juice is to dissolve and render fit for absorption, not only starch, but also flesh and other protein bodies. They assert that the intestinal juice not only metamorphoses starch with as great rapidity as saliva and pancreatic juice, but also, that the intestine exerts as powerful a digestive influence on flesh and albumen as the stomach. Frerichs, on the other hand, has been unable in his experiments to detect any change exerted by the intestinal juice upon the protein elements of the food.

Protein bodies, gelatinous substances, fat and starch, remained

unchanged, and he denies positively that the intestinal juice has any action as a direct digestive agent. Professor Lehmann, in a series of experiments upon the intestinal fluid collected from a loop of a gut from a human being, with a fistulous opening into the small intestine, found that it possessed, in a high degree, the power of converting starch into sugar, whilst protein bodies and fats were not affected in any appreciable manner. Professor Lehmann, however, attaches little importance to these experiments performed by himself, from the fact that the fistulous opening was in the lower portion of the ileum, and probably near the cæcum. He adopts the experiments of Bidder and Schmidt, and by an argument drawn from the amount of gastric juice secreted in a given length of time, and the amount of protein substances which it is capable of digesting, concludes that a large portion of flesh and albumen and the other protein bodies pass out of the stomach undigestsd, and are finally dissolved by the intestinal juice.

According to Professor Lehmann, the amount of gastric fluid secreted by a dog in 24 hours, equals one-tenth the weight of the whole body. 100 grs. of recent gastric juice are capable of dissolving from three to five grains of coagulated albumen. A dog needs daily, for the perfect maintenance of all the physiological functions, 50 grains of flesh (containing 10 grains of albuminates) for every 1,000 grains of its weight. It secretes, however, only 100 grains of gastric juice for every 1,000 grs. of its weight, only one half the amount capable of dissolving the albuminates of the flesh. Hence, a large portion of the protein bodies must pass out of the stomach undigested.

Careful experiments have shown that the gastric juice is deprived, in the duodenum, of its free acid, and with it of its power of digestion, by the bile and pancreatic fluid. Hence, other fluids must flow into the intestines which are capable of dissolving the protein bodies.

The only method of deciding accurately upon the truth of these conclusions, drawn by Prof. Lehmann, from the preceding argument, is to appeal to the physico-chemical process of digestion, as it is performed in a normal condition in the animal economy.

I have enjoyed numerous opportunities of examining the con-

tents of the stomachs of fishes, reptiles, birds and mammalia, in every stage of the digestive process, and never have I discovered undigested particles of flesh in the small intestines. The following observations were made during the prosecution of various researches upon the blood, urine, relative weights of the organs, and comparative anatomy, and minute anatomical structure of the organs of different animals, without any reference whatever to the maintenance of a theory.

The stomach of an alligator (Alligator mississippiensis) contained the bones, teeth, hoofs and hair of a pig. The meat had been entirely digested, leaving the bones as clean as those of a prepared skeleton.

In the stomach of other alligators we have found fishes, snakes, crabs, &c., in different stages of digestion, some but slightly acted upon by the gastric juice, others partially dissolved, whilst of others little more than their bones remained.

The stomach of a bull-frog, (Rana pipiens,) which had been captured 24 hours, contained several craw fish (Astacus Bartoni) and a long slender grass snake (Tropidonotus ordinatus) about three feet in length. Although this food had been swallowed for more than 24 hours, only the exterior parts of the body of the serpent showed the evidences of the action of the gastric juice, and the shell of the invertebrate animals was of a red color, resembling that which they assume after they have been acted upon by boiling water.

In the stomachs of serpents we have found smaller serpents, lizards and mice, in all stages of digestion, whilst the small intestines contained not a particle of meat. These observations were also verified by an examination of the contents of the stomachs of fishes, carnivorous birds, as the buzzards, hawks, cranes, herons, &c., and also of carnivorous mammalia, as raccoons and dogs.

If one-half of all the meat received into the stomach passes into the small intestines, and if the process of digestion, is, according to the statement of Bidder and Schmidt, as slow as that of the stomach, why is it that its presence always eluded observation when the intestinal canal was laid open? In the case of animals which swallow their prey whole, without any mastication, how could portions of meat with large bones attached pass

out of the capacious stomach into the contracted intestine, without being evident to the observer. All the observations thus far made convince me that meat is entirely digested in the stomach.

Another fact worthy of note is, that in the stomach of all animals, whether cold or warm-blooded, which I have examined during the process of digestion, the amount of fluid, containing the digested matters in solution, was exceedingly small, ofttimes amounting to only a few drops, and in many cases, especially amongst cold-blooded animals, it appeared to be almost entirely absent. This proves that, in the normal process of digestion, the matters dissolved by the gastric juice are almost immediately absorbed or pass into the duodenum.

The idea that a solution of the albuminous matters accumulates in the stomach which has been called chyme by writers, is erroneous. This fact shows the fallacy of Prof. Lehmann's argument. He calculated the amount of flesh which could be digested by a given quantity of gastric juice out of the body. In nature the process is far different from that of artificial digestion. A portion of gastric juice dissolves a definite amount of flesh, and the solution is then absorbed, or passes out into the small intestines. Another portion of gastric juice is secreted and acts upon the fresh exposed surface of the flesh, and the products of its action are in turn absorbed.

It is evident to every candid observer, that this process is far more energetic than that of artificial digestion, and consequently the one cannot be the measure of the other, and the argument founded upon artificial digestion falls to the ground.

Even granting that artificial and normal digestion are precisely similar as far as the rapidity of their actions is concerned, how is it possible for Prof. Lehmann to determine the amount of gastric juice secreted by the stomach in a given time, when absorption is almost as rapid as secretion. In the consideration of the digestion of protein bodies, he leaves this fact entirely out of view. The absorption and passage of the digested matters out of the stomach immediately after their solution, is true also of granivorous and frugivorous animals. I have examined the stomach of numerous squirrels, rats and birds, fed upon grain, acorns, nuts and berries, and in every instance there was no

fluid which corresponded to the chyme of writers. Even in those animals which subsist upon grasses, and green buds, and leaves, which contain a larger amount of fluid, the contents of the stomach are comparatively dry. Almost every one has it in his power to verify the truth of these observations, by simply walking to the butcher pens and examining the contents of the stomachs of cows and sheep.

Amongst cold-blooded animals, the only frugivorous animals which I was able to examine, was the gopher, (Testudo polyphemus.) In this animal the grasses and vegetable matters appear to be principally digested in the colon.

The colon of the gopher enlarges into a receptacle for food, 30 inches in length and four inches in circumference. In one instance, after 30 days' starvation, the undigested vegetable contents of the colon and cæcum amounted to 1460 grains. The gopher has the power of retaining in its intestines vegetable food without either digesting it, or allowing it to putrefy or ferment. When, however, it is removed from the intestinal canal, in the course of a few days it putrefies and becomes filled with numerous worms. This is a provision of the Creator, adapting this animal to the habitation of a sandy and barren country, where it is often impossible to obtain water, and where vegetation is scarce. The colon contains a store of vegetable food, which replaces the wastes of the blood and tissues during long seasons of drought and starvation, and supplies the place of the masses of fat found in the abdominal cavities of many Chelonians, Ophidians and Saurians, which are consumed during long fasting.

Comparative Anatomy and Physiology of the Pancreas.

In the invertebrate kingdom no lymphatic system has been discovered, and the existence of a pancreatic gland has not as yet been satisfactorily demonstrated. Siebold considers two thick-walled cæca, lined with ciliated epithelium and opening into the beginning of the stomach, in many Rotatoria, a rudimentary pancreas. Hunter, Grant, Owen, Siebold and Rhymer Jones, consider the pale yellow, ramified tubes, which in many species of Cephalapoda are appended to the hepatic ducts, as true representatives of the pancreatic glands of higher animals.

These, however, have not been certainly demonstrated to be pancreatic g'ands, for no comparative anatomist or physiologist has as yet described the special character and offices of their secretion. A rapid review of the character of the digestive apparatus and circulatory system of these animals, will show why the lymphatic system and pancreas should be absent.

In the lowest forms of the Protozoa, which are simple cells provided with vibratile ciliæ resembling closely the sporules of vegetables, we find neither organs nor a circulatory system. The highest members of this group have contractile pulsatory cavities situated in the denser and outer layers of the parenchyma of the body. No blood vessels communicate with these cavities, and no special walls have been discovered surrounding them.

In the Polypi, inarticulate, fleshy bodies, having a simple visceral cavity, with a single opening at the centre above, without intestines, without glands separate from the walls of the visceral cavity, with no distinction of sex, and an imperfectly developed nervous system in the highest, and none whatever in the lowest, the circulatory system is rudimentary, and the fluid which it distributes nothing but the digested matters of the visceral cavity. The tubular axis of the collonial polyps communicates with the visceral cavities of all the individuals which compose the colony, and an oscillatory movement of the products of digestion which it contains, without any elaboration by special organs, and without any special organs of circulation, reminds us strongly of the motion of the fluid contents of the cells in the vegetable kingdom. In most of the invertebrata the digestive sac is surrounded by a cavity or sac called the visceral cavity. In many polyps these two cavities communicate freely. In the higher invertebrate animals these two cavities are separated from each other, and the nutritive materials pass into the exterior visceral cavity only by transudation through the walls of the stomach and intestinal tube. In certain Crustacea and the lowest Mollusca, the movement of these nutritive matters backwards and forwards, by the irregular contractions of their bodies, constitutes the only means by which their tissues are supplied with nutriment, and even in the higher Mollusca, Insects and Crustacea, the circulatory system is in free communication with

the visceral cavity. In all these animals there is no other absorption but that which takes place through the walls of the alimentary canal into the digestive cavity.

Even in the Echinodermata and Annelida, which have a closed circulatory system, the principal channel for the transmission of the nutritive materials through the system appears to be from the visceral cavity. In these animals, however, absorption must also take place, to some extent, from the blood vessels, minutely distributed over the intestinal tube.

From this hasty review of our knowledge of the invertebrate animals, we see that their circulatory apparatus, organs and tissues, are not sufficiently developed and perfected, to call for the existence of a lymphatic system.

One office of the lymphatics is the absorption of fatty matters after they have formed an emulsion with the pancreatic fluid. In most invertebrate animals, the conditions for the formation of this emulsion and its absorption do not exist, because the digested matters pass directly from the alimentary canal and visceral cavity, into the blood-vessel system, without absorption.

In the four great classes of vertebrate animals the circulatory system is completely separated from the digestive cavity, all the organs and apparatuses are highly developed, and the existence of a special system of absorbents appears to be absolutely necessary for the preservation of the integrity of the fluids of the animal economy, and also for the absorption of fatty matters, which are of great importance in the maintenance of animal temperature.

In Fishes, the development and perfection of the pancreas correspond in no degree with the position occupied by different individuals in the classification of naturalists. The most superficial examination of the gland under consideration, will show that many animals of an exceedingly simple construction often have individual organs more highly developed, than animals which stand far above them in physical and mental constitution.

Thus, in the lowest orders of the cartilaginous fishes—the Cyclostomi and Plagiostomi—it resembles in all respects this gland in the most highly organized mammalia. In the Sturiones its structure is somewhat simplified, and in the majority of osseous fishes it is reduced to its rudimentary form, consisting

of cæca varying in number in different species, and opening into the duodenum, below the circular valve of the stomach; whilst in others, as observed by Cuvier in the conger eel, pike and carp, and by Muller, in the Ophisurus serpens, it is intimately associated with the intestinal mucous membrane, consisting of simple follicular depressions, lined with the peculiar cells, constituted to secrete the pancreatic fluid. It cannot, therefore, be asserted as a universal law without any exception, that there is a regular progression in the development of the different organs in animals corresponding to the position which they occupy in the scale of creation. It matters not whether we view the pancreas in its earlier stages of development in the higher animals, or in its permanent condition in many of the osseous fishes, its structure is the same.

By classifying this organ according to its development in fishes, we have an exact history of the changes which occur during the development of this gland in the higher animals. The permanent forms of the pancreas of the former are but transitory conditions, forming the stages in the development of this organ in the latter. According to Muller, Weber and Wharton Jones, in higher animals, which have a perfect pancreas, its development, like that of the salivary glands, commences by a simple diverticulum, or cæcum, from the walls of the duodenum. This subdivides into bud-like processes. As the development of the gland advances, the canal and its branches become more and more ramified and subdivided, until the compound racemose lobulated gland is formed. Precisely the same stages of development in a permanent form, are discernible in the different orders, genera and species of Fishes.

Mere cells or follicular depressions in the mucous membrane of the small intestines, according to the observations of Cuvier, Muller and Solly, perform the offices of the pancreas in several species, as the Hyppoglossus rondeletus, conger eel, pike and carp, and Ophisurus serpens.

In the Ammodytes tobianus there is a single cæcum prolonged into a pouch, representing this gland in its rudimentary condition.

In the Octopus the single pancreatic appendage is prolonged and specially convoluted. Five of these cæca occur in Salmo

spirinchus, six in Perca lucioperca and Sargus annularis, seven to eight in the bass, (Corvina ocellata,) and ten to thirty and more in many salmons and herrings, and from eighty to ninety in the common salmon.

Several species of Plaice have two, whilst others have three, like the river perch and common loach, whilst the Platessa oblongata has four of these cæcal pouches, which open into the pylorus and duodenum.

In Gadus and Scomber the number is greatly augmented, and the complexity of the gland increased by the division of the cæca. In Scomber thynnus four large trunks arise from the intestine and divide into branches, each of which subdivide and terminate at length in a tuft-like fasciculous of narrow tubular cæca.

In the salt-water garfish, (Lepisosteus osseus) of Georgia, the pancreas is situated with its superior convex border in contact with the inferior concave border of the liver, which resembles in shape and appearance this organ in serpents. The inferior border is in contact with the spleen. Upon the exterior it consists of numerous short cæca, which radiating inwards, unite together forming several branches, which again unite and constitute one short duct, having a diameter almost equal to that of the small intestine into which it opens. The duct branches, and cæca generally contain, especially after a meal of fish, a cream-like fluid, which, under the microscope, is found to be a true emulsion, containing innumerable minute globules of oil in a transparent fluid. The large opening of the duct of the pancreas is so situated just at the bend of the duodenum, that all the digested food, after passing the stomach, must be submitted to the influence of its secretion, and much passes into the duct and cæca. All the oleaginous matters must therefore be brought into contact with the pancreatic juice, and in this manner an emulsion is formed and prepared for absorption. The emulsion is not found in the stomach above the opening of the duct of the pancreas, but exists in greatest abundance in its immediate vicinity and within the cæca.

The structure of this gland in the fresh-water Garfish of the swamps of Georgia, is constructed on a similar plan; its cæca, however, are longer, and the branches more distinct. The duct

branches and cæca contained in every instance, after a full meal, a similar fatty emulsion.

In the sword-fish (Ziphias gladius), this organ is very large, and Professor Grant states, in his lectures upon comparative anatomy, that it weighs six ounces more than the liver. It consists of innumerable small cæca, connected together by cellular tissue, in which ramify the capillary vessels. These cæca form a reniform mass, which is surrounded with a muscular tunic and the peritoneum. When opened, the innumerable component cæca are found to be formed by the successive divisions of the single great duct, into which they all pour their secretions into the duodenum immediately below the pyloric valve.

In the sturgeon, the structure of the pancreas is similar to that of the Ziphias gladius. The hundreds of cæca ramified from one common duct, are enclosed in a muscular and peritoneal coat. The contraction of the muscular tunic compresses the cæca and forces their secretion into the intestinal canal. The excretory duct opens close to the pyloric valve, and the termination of the ductus communis choledochus.

In the eel, pike, and fresh-water trout, we find a yellowish white compact and glandular pancreas, having from two to three excretory ducts, which are frequently accompanied in their course to the intestine by the biliary ducts. In the trout and some others there exists both pyloric appendages and a compact pancreatic gland. In the hammerhead shark (Zygæna malleus), we find an elongated, narrow, flattened, light yellow, compact pancreas, with little lobulation.

In the stingray, this organ is of a yellow color, well defined, lobulated form, resembling in all respects the perfectly developed pancreas of the Mammalia and other vertebrata.

The pancreas of the doubtful reptiles assume the appearance presented by that of the sturgeon, shark, and warm-blooded animals.

In the Menobranchus maculatus it is an irregularly shaped gland, having four principle lobes diverging from each other at right angles, thus presenting a stellated arrangement. The pancreas of the hellbender, (Menopoma alleganensis,) is a long delicate light yellow gland, which commences near the pyloric extremity of the stomach, and extends down along the duodenum

and small intestine for about three inches. Its inferior portion is more expanded than the superior. The pancreas of the congo snake (Amphiuma means), is similar in structure and appearance to that of the Menopoma alleganensis, with the exception that it is broader and thicker.

In the Batrachia, the pancreas present a developed appearance, and generally commences by a small slender lobe, at the pyloric extremity of the stomach, and passing downwards and forwards expands into a broad lobulated mass. As in many other cold-blooded animals, it is not in contact with the spleen.

In all the American Ophidia which I have had the opportunity of examining, as the banded rattlesnake (Crotalus durissus), the water rattlesnake (Crotalus adamanteus), ground rattlesnake (Crotalophorous miliarius), water mokeson (Trigonocephalus piscivorous), copperhead (Trigonocephalus contortrix), hognose viper (Heterodon platyrhinus,) black viper (Heterodon niger), grass snake (Tropidonotus ordinatus), (Tropidonotus fasciatus), green snake (Leptophis æstivus), coach-whip snake (Psammophis flagelliformis), indigo snake (Coluber Couperi), chicken snake (Coluber quadrivittatus), corn snake (Coluber guttatus), black snake (Coluber constrictor), the pancreas is a compact ovoid gland, often kidney-shaped, situated in contact superiorly with the gall bladder, and inferiorly attached to the duodenum. The spleen, which is very small in these animals, is attached to the antero-superior surface of the pancreas. The hepatic and cystic ducts perforate the substance of the pancreas, and, uniting with its duct, enter the duodenum.

In the carnivorous Chelonia, the pancreas is a large, well developed, light yellow lobulated gland.

In the soft-shelled terrapin (Trinonyx ferox), it commences opposite the pyloric valve of the stomach. The principal lobe extends down along the small intestine about three inches. At the inferior portion it sends off two lobes. The inferior one short and broad; the superior longer, and passing downwards comes in contact with the spleen and passes along the anterior surface of this organ. The structure, position and appearance of this gland does not differ in any essential respect in the Alligator cooter, (Chelonura serpentina,) loggerhead turtle (Chelonia caretta), salt water terrapin (Emys terrapin), chicken terrapin (Emys reticu-

lata), yellow belly terrapin (Emys serrata), and other carnivorous terrapins. In the gopher, however, which is the only herbivorous Chelonian in Georgia, the size and appearance of the pancreas is far different. It is a long, delicate gland, consisting of several slender and thin lobes, sub-divided into numerous small lobules.

Its size is far smaller than that of carnivorous terrapins. The reason of this will be readily understood when we consider the functions of the gland.

In birds the pancreas is a conglomerated gland, generally of large size, and is invariably lodged within a loop formed by the duodenum. It generally consists of two portions or lobes, united by a slender isthmoid partition. In some individuals it is single, and in others consists of three lobes. From each lobe an excretory duct is given off. These ducts terminate separately in the intestine near the opening of the biliary canals.

The color and appearance are similar to that of the well developed pancreas in all animals, cold or warm-blooded, and it is remarkable how constant is the color of the different glands in vertebrate animals. Any one familiar with comparative anatomy and physiology, will distinguish the different organs in any animals at a single glance. How uniform must be the operations of nature, when even the color of organs are definite and immutable, and have remained thus from the creation.

The pancreas of the omnivorous and carnivorous Mammalia, resembles in appearance and structure that of man, and its secretion enters the duodenum at the same point as that of the liver. In the apes, the Ruminantia, and most Carnivora and Rodentia, it has but one duct, which usually unites with the biliary. In some individuals, as the horse, hog, otter and beaver, it has two ducts, one of which unites with the biliary duct, and the other enters by itself, farther behind into the duodenum. In the rabbit, the biliary and pancreatic ducts are separated from each other by a considerable interval.

The pancreas of all the carnivorous Mammalia, which I have thus far examined, is much larger than that of the frugivorous Mammalia. This illustrates an important physiological fact, and will be demonstrated by numerous comparative weights of the organ, accurately ascertained.

Having considered the developement, structure and comparative anatomy of the pancreas in the four great classes of vertebrate animals, we will next study its use in the animal economy. Although Mayer, Magendie, Tiedeman, Gmelin, Leuret, Lassaigne, and other physiologists and chemists had investigated the physical and chemical properties of the pancreatic fluid, still one of its important offices was entirely unknown, until the researches of M. Cl. Bernard,* demonstrated that it is indispensable for the formation of chyle and the absorption of fatty matters. Previous to this discovery, it was considered similar to the fluid secreted by the salivary glands, and its principal use was affirmed to be the conversion of starch into glucose.

The investigations of M. Cl. Bernard, demonstrated that the limpid chyle (formerly called vegetable chyle), is the product of the digestion of materials which contain no fatty matters, and the white chyle (called formerly animal chyle), contains fatty matters in the state of an emulsion, and the lymphatics of the mesentery are found to contain a white milky fluid, only after the absorption of fatty matters, and that this emulsion and modification of the fatty matters were effected by the agency of the pancreatic juice. These conclusions were derived from the results of numerous ingenious experiments.

If dogs are fed upon oleaginous matters and killed at different periods, oil will be found unaltered until it comes in contact with the pancreatic fluid, and if the pancreatic ducts be tied, all alteration is prevented and the oil remains transparent.

The most conclusive and beautiful of all Dr. Bernard's experiments were performed upon the rabbit.

In this animal, the pancreatic duct opens into the intestine very low down, from six to fourteen inches below the hepatic duct; and if fatty matters be introduced into the stomach, and the animal killed in three or four hours, they will be found to have become emulsioned, and the lymphatics of the mesentery filled with white chyle. M. Cl. Bernard further showed, that if fatty bodies be exposed to the pancreatic fluid out of the body, a complete emulsion is formed; and if it be allowed to remain long enough, the fatty substances will be decomposed into glycerine

*Annales des Sciences Natur., Sept., 1848.

and fatty acids, and in the case of butter, butyric acid. Parallel experiments instituted with other fluids, as bile, saliva, gastric juice, serum of the blood, produce no such effects on fatty bodies. It is probable that M. Bernard supposed that fats were in the animal economy resolved into glycerine and fat acids. This process, however, would be very complicated, and involves many difficulties, and it is more reasonable to suppose that the action of the pancreatic juice is limited to the formation of an emulsion, which is nothing more than the mechanical division of the fat into minute globules, coated with a thin film of the albuminoid elements of the pancreatic juice. That this is really the case in living animals, I have enjoyed many opportunities of demonstrating whilst examining the pancreas of the garfish, (Lepisosteus osseus.) In this fish, the duct of the pancreas has a diameter almost equal to that of the intestine, and is so situated that all the digested matters which pass out of the stomach must come in contact with its secretion, and often pass in considerable amount into the duct and cæca of the gland. When the emulsion is squeezed out of the duct and cæca, and subjected to the microscope, it is found to consist of innumerable minute globules of oil, surrounded by a transparent fluid.

The correctness of M. Bernard's observations have been called in question by Dr. Bence Jones, Lenz, Frerichs, Bidder, Schmidt, Lehmann, Donders and Herbert. It is asserted that the bile and intestinal juice are even more active and efficient than the pancreatic juice in the preparation of fatty matters for absorption.

It is objected to Bernard's experiments, that he delayed his examination of the animals too long, and allowed the emulsion formed with the bile to pass down and be absorbed before inspecting the viscera of the rabbits. Dr. Samuel Jackson,* Professor of the institutes of Medicine in the Univerity of Pennsyl vania, has recently examined this subject carefully, and repeated the experiments of Bernard, avoiding every source of error, and especially that of time, by causing oleaginous matters to enter the digestive apparatus constantly, until the moment of observation. In every instance, the results of his experiments confirmed the correctness of Bernard's conclusion that the emul-

* American Journal of Medical Sciences, October, 1854, page 307.

sion of fatty matters is produced by the action of the pancreatic juice.

After exposing the errors of the experiments upon which the German physiologists found their opposition to this doctrine, the Doctor concludes his valuable paper by the following summary of the present state of our knowledge :—

1. "Liquid fats are not miscible with the aqueous albumino-saline fluid—liquor sanguinis—with which all the vascular tissues are saturated; it cannot enter their pores, and consequently cannot be absorbed.

2. Liquid fats, when emulsified by albumen, are reduced to minute particles, each coated with albumen. In this state they are miscible, with the liquor sanguinis moistening the tissues, can enter their pores, and are then capable of absorption. This is the sole condition requisite for the absorption of fats."

3. "The white, milk-like fluid named chyle is this emulsion of the fatty matters of the food, mixed with the ordinary lymph, always contained in the lymphatics of the alimentary canal and other abdominal organs and mesentery. The molecular base of Gully is the microscopic appearance in the chyle of the minute globules of fat coated with albumen.

4. "Albumen forms a perfect and persistent emulsion with oils. The pancreatic fluid is a saturated albuminous solution, and forms with oils an emulsion equally as perfect and permanent as that of albumen.

5. "The pancreatic juice is the only highly albuminous fluid in the alimentary canal, and can accomplish the formation of a perfect emulsion; and the opinion of M. Cl. Bernard, that this process is one of its functions, is, it appears to me, sustained.

6. "The observations of M. Cl. Bernard, that the formation of the emulsion of fats in rabbits, is at and below the pancreatic duct, and not above it, is confirmed by the experiments reported in this communication. And, further, that the experiments upon rabbits are the most reliable, as being a true exemplification of the natural process, unattended with violence and torture to the animals, more or less disturbing in their effects.

7. "That M. Cl. Bernard's view of the decomposition of fats by the pancreatic juice is not proved, is opposed by the nature of the process and by analogy with other emulsions; it is un-

necessary to the accomplishment of the absorption of fats, and introduces other and complicated processes that are unknown to exist, and are mere hypotheses."

Whilst engaged last summer in the investigation of the physical and chemical constitution of the fluids, and the comparative anatomy and physiology of cold-blooded animals, it occurred to me that the pancreas of cold-blooded animals should be larger than that of the frugivorous or granivorous animals, because it is much more incessantly exercised in the secretion of a fiuid for the emulsifying of fats. Accordingly, I ascertained accurately the weights of the body and pancreas of every animal that fell into my possession. Dividing the weight of the former by that of the latter, we obtain the weight of the pancreas in relation to that of the body, and the relative size of this organ in different animals is thus ascertained. The weights of the animals were taken upon a pair of scales capable of turning to half a grain, and the weights of the organs were taken upon a delicate balance, capable of turning to one-thousandth of a grain.

The following table contains the most important results thus obtained.

Comparative weight of the Pancreas of Carnivorous Fishes and Reptiles.

		Times the weight of its Pancreas.
Weight of	Female Stingray (Trygon sabina)	1071.
"	Hammerhead Shark (Zygæna malleus)	1045.
"	Hammerhead Shark (Zygæna malleus)	1563.
"	Female Garfish (Lepisosteus osseus)	193.
"	Female Garfish (Lepisosteus osseus)	212.
"	Bull Frog (Rana pipiens)	1088.
"	Black Viper (Heterodon niger)	537.
"	Coachwhip Snake (Psammophis flagelliformis)	1353.
"	Corn-Snake (Coluber guttatus)	1371.
"	Black Snake (Colluber constrictor)	472.
"	Banded Rattle Snake (Crotalus durissus)	965.
"	Loggerhead Turtle (Chelonia caretta)	518.
"	Alligator Cooter (Chelonura serpentina)	630.
"	Salt-water Terrapin (Emys terrapin)	994.
"	Chicken Terrapin (Emys recticulata)	763.
"	Yellow-belly Terrapin (Emys serrata)	1067.
"	Male Yellow-belly Terrapin (Emys serrata)	1200.
"	Female Yellow-belly Terrapin (Emys serrata)	1343.

Comparative weight of the Pancreas of Frugivorous Chelonians.

	Times the weight of its Pancreas.
Weight of Male Gopher (Testudo polyphemus)	3500.
" Male Gopher (Testudo polyphemus)	3061.

Comparative weight of the Pancreas of Carnivorous Mammalia.

	Times the weight of its Pancreas.
Weight of Female Raccoon (Procyon lotor)	241.
" Female Raccoon (Procyon lotor)	155.
" Fetus of Raccoon (Procyon lotor)	583.
" Common Cat	402.
" Pointer Dog	337.
" Opossum (Didelphis virginianus)	192.

Comparative weight of Pancreas of Frugivorous and Granivorous Mammalia.

	Times the weight of its Pancreas.
Weight of Common Sheep	1125.
" Grey Squirrel (Sciurus carolinensis)	3026.

By comparing these numbers carefully, we are taught the following facts and conclusions:

1. The pancreas of the garfish, (Lepisosteus osseus,) a powerful, voracious and active fish, is much larger than that of more sluggish fishes. The garfish consumes large numbers of small fishes, which it readily captures with its long and well armed jaws. The tissues and organs, especially the liver of fishes, contain much oil, and consequently a large gland is needed to afford a sufficient amount of the peculiar matters absolutely requisite for the preparation of the oleaginous matters for absorption. We have previously stated that, in the pancreas of this remarkable fish, we have an absolute demonstration of the function of this gland.

2. The pancreas of carnivorous fishes and reptiles is relatively much larger than that of frugivorous Chelonians. This difference in the relative size of this organ in these two classes, is evident at a glance. In the Ophidians it is a compact ovoid gland, and in the carnivorous Chelonians it is a broad lobulated, well developed, conspicuous gland, whilst in the frugivorous Gopher (Testudo polyphemus) it is a thin, delicate, obscure gland, composed of several slender lobes, subdivided into numerous small lobules.

3. The pancreas of carnivorous mammalia is much larger than that of the frugivorous or granivorous. The strongest excep-

tion to this assertion appears to be in the beaver, which is stated to have an unusually large pancreatic gland. A consideration of the character of the food of this animal, will, we think, explain this anomaly. In this animal the stomach, and more especially the cæcum, is stated by observers to be plugged up with fragments of bark and wood, which appear to constitute its chief aliment. The experiments of Mitscherlich have shown that alkaline solutions are capable of converting cellulose into starch even more readily than concentrated acids. It is therefore highly probable that the great office of the alkaline pancreatic fluid in these animals, is the preparation of cellulose for absorption by converting it into starch.

4. The pancreas of carnivorous fishes and reptiles is larger than that of frugivorous and granivorous mammalia, notwithstanding that the *digestion* of the former is much slower than that of the latter, and the amount of nutritive matters necessary to sustain the economy much less.

5. The pancreas of carnivorous mammalia is larger than that of carnivorous, cold-blooded animals, because the digestive process is much more rapid, and correspondingly larger glands are needed to supply the secretions necessary for the proper preparation of the food for absorption.

The difference between the weights of the organ in these two classes of animals, does not correspond exactly with the disparity of their respective digestive processes, because the sluggish circulation and æration of the blood, and the small amount of nervous force possessed by cold-blooded animals, require much larger organs to accomplish precisely the same results. As circulation and respiration are developed and perfected, and all the acts of life rendered correspondingly active and energetic, the more perfect and condensed become the organs and apparatuses.

These results were demonstrated, as far as simple dissection and inspection could show them, upon other animals, killed in swamps and woods, and at periods when it was impossible to ascertain their weights.

Our investigations upon birds have not been sufficiently extended to warrant general conclusions.

Whilst experimenting upon the effects of starvation and a change of diet upon the blood of carnivorous terrapins, I found

that the pancreas of many of those which had been deprived of food and drink for a length of time, and then placed in a tub of water and liberally supplied with vegetable food, (purslain, Portulacca oleracea,) was diseased. Parts of the gland were of a black color and hard texture, and under the microscope contained cancer cells and crystals, which resembled in appearance those of the triple phosphate. It is probable that the gland, not being normally exercised, degenerated in structure.

In the first of a series of experiments which have not as yet been completed, I ascertained the correctness of M. Cl. Bernard's statement, that fatty matters are not altered in the stomach or intestines of dogs, if the pancreatic duct be tied.

The abdominal cavity of a remarkable large and voracious pointer dog, noted for his powerful digestive powers was opened along the linea alba, and f.ʒii of lard oil secured in the stomach, by ligatures above and below, and f.ʒi were injected and secured in the same manner, in the intestines. The viscera were then carefully returned and the wound sowed up. At the expiration of six hours, the dog was killed, and the contents of the stomach and intestines had neither increased nor diminished, and were changed neither in physical or chemical properties, and the lymphatics of the mesentery did not appear to contain any milky emulsion. Under the microscope, the lard oil presented an appearance differing in no respect from that of ordinary oil. Lard oil was enclosed separately in the stomach and intestines of a dog, and immersed for eighteen hours in the serum of this animal. At the end of this time neither endosmose of the serum, nor exosmose of the oil, had taken place. In the living dog, the blood-vessels of the stomach and intestines retained their natural size and appearance. When saline solutions of high specific gravity were enclosed in a similar manner in the stomach and intestines of dogs and cats, the blood-vessels were congested with blood, and the internal surface of the mucous membrane presented a pinkish purple color.

The following general conclusions have been drawn from this study of the comparative anatomy and physiology of the pancreas.

1. In the invertebrate animals, this gland and the lymphatic system do not exist, because the character of the circulatory system and the manner in which it receives the digested matters

from the visceral cavity, are such, that the conditions requiring their presence do not exist.

2. In fishes we may study the development of the pancreas, the permanent forms being but the transient conditions in the development of this gland in the higher animals.

3. The assertion of M. Cl. Bernard, that the chief office of the pancreas, is to prepare fatty matters for absorption is sustained by the following facts.

a. In the garfish (Lepisosteus osseus,) the emulsion of the fatty matters takes place in the duct and cæca of the pancreas, and their immediate vicinity, and nowhere else in the alimentary canal.

b. The pancreas of carnivorous animals is relatively much larger than that of frugivorous and granivorous animals. The amount of oil consumed by the former is much greater than that consumed by the latter. It is reasonable to infer from these facts, that the principal office of the pancreatic juice, is the preparation of fats for absorption. This is farther sustained by the fact that the size of the pancreas amongst carnivorous animals is in a measure proportional to the amount of oleaginous matters consumed. The pancreas of the active, voracious gar-fish who destroys large numbers of small fish, is larger than that of the more sluggish fishes.

c. The pancreas of carnivorous Chelonians, fed upon vegetable matters, degenerated in its structure.

Mortality of Philadelphia for January, February and March, 1856; *collated from the Health Office record.* By Wilson Jewell, M. D.

During the first quarter of the present year, beginning with Dec. 29th, 1855, and terminating with the 29th of March, 1856, a period of 91 days, the deaths recorded at the Health Office amounted to 2810, averaging nearly 31 deaths per day. An increase of $3\frac{1}{2}$ per day, over those for the like period in 1855.

The deaths from diseases alone, number 2343, while the remainder were attributed to Still Born, External Causes, Old Age, Debility, Malformation and Unknown, amounting to 467. Of these, 103 were still born children.

The excess of deaths is with the males, amounting to 2.70 per

cent. The excess of deaths among the males from external causes is equal to 45 per cent.

The deaths among children under five years amounted to 1190, equal to 45 per cent. of the whole number of deaths, exclusive of Still Born.

The highest mortality of any one disease was from Consumption of the lungs, 394. Small Pox, which has been very prevalent, furnished 238, and Scarlet Fever 189 deaths. The increase of deaths from these two forms of eruptive fevers, swelled the class of Zymotics to 670, equal to the deaths from the respiratory organs, which are always more prevalent during the winter season.

Under the head of Organs of Generation, we find recorded 26 deaths from Puerperal Fever, which is an unusually large number for one quarter. In 1855, the deaths from this disease for the entire year were only 41. It will be seen that we have departed from the usual classification, and placed the deaths from Puerperal Fever, with those charged to the organs of generation, as the most suitable place for them.

The deaths under twenty years, constitute 55 per cent. of the entire mortality, exclusive of Still Born. Those under one year, were nearly equal to one fourth of the whole.

The deaths fromConsumption of the Lungs, amounting to 394, or nearly 15 per cent, of the entire mortality, exclusive of Still Born, exceeded those for the like quarters since 1852

The increase of deaths, from "Disease of the Heart," (what kind ?) will be observed. This vague distinction constitutes nearly two-thirds of all the deaths from diseases of the organs of circulation, and shows the want of attention to diagnosis, in those affections involving the heart and its membranes.

Of the entire mortality for the quarter, there were 1106 in January ; 861 in February, and 843 in March. Of this total, 1443 were males, and 1367 females. The adults numbered 1176, while the children, or those under 20 years, amounted to 1634, of whom 849 were boys, and 785 girls, showing an excess of 3.91 per cent. of deaths among boys.

The deaths noted as from the Alms House were 182. Those of the colored population 138 ; from the country 35, and from the County Prison 2.

Small Pox, has been extensively prevalent during the entire quarter; the deaths averaging 18 per week. It assumed somewhat of an epidemic character; was not confined to any particular section of the city (the built portions.) It invaded all classes in the community. While each decennary period of life, from birth up to that between 50 and 60, contributed subjects for the mortuary record, infancy, or that term particularly between birth and 10 years, made up the heaviest amount.

Of the whole number for the quarter (238), one hundred and sixty-six, or 69.74 per cent., were in children under ten years of age.

The prevalence of Small Pox among children, and hence the large number of deaths, must be attributed in a great degree to a palpable defect in the ordinance for public vaccination, in which, for the two years past, the collectors of vaccine cases are dispensed with.

As an evidence of the correctness of our opinion as to the cause of this large mortality among the infantile population, we learn that the temporary collectors of vaccine cases appointed by the Board of Health for one month (March 1856), returned, during that period, the names of more than six thousand persons for vaccination! a large majority of whom were unvaccinated children.*

The ordinance alluded to has been amended, so as to provide for collectors of vaccine cases in the future.

At the present time the Small Pox is declining.

Scarlet Fever presents a large mortality for the quarter, averaging over 14 deaths for each week; children have been the principal sufferers, of whom 92; or nearly 49 per cent., were between the ages of 2 and 5.

No week passed without fresh cases of the disease. Many of these cases were unusually malignant in their character, while others were known only by the sequelæ.

Our long continued cold winter, remarkable for the amount of

* The results of vaccination in the Prussian army strongly exhibit the power we possess of controlling the ravages of Small Pox. (See Med. Exam. July 1855.) In Berlin, where vaccination is compulsory, not a single death occurred from Small Pox during the last year.—Ed.

snow that fell, and the quantity and thickness of the ice formed in the Delaware and Schuylkill Rivers, brought with it an increased prevalence of inflammatory diseases. Eruptive affections of every kind have also been unusually numerous. Erysipelas, carbuncles, boils, felons, together with eruptive fevers, have all appeared beyond the ordinary number during the quarter; while the acute diseases of the organs of respiration have been not only severe in their character but remarkably prevalent.

Puerperal fever, has also provided an uncommon share of the deaths for the quarter. The record says 26; but on reference to the deaths from diseases of the digestive organs, it will be found that 14 females died from peritoneal inflammation; some of whom, in all probability, were lying-in-women.

Fifteen of the above 26 deaths were from the Philadelphia Hospital, (Blockley,) where the disease has prevailed to a severe and fatal extent.

Dr. R. K. Smith, the chief resident physician of that institution, has furnished an interesting and valuable report of 27 cases, as they occurred in the lying-in ward, which will be found in the last (April) number of the Examiner.

The disease, however, has not been generally prevalent, and where it has existed it is now disappearing.

TABLE NO. I.

Deaths for the first quarter of 1856 *classified.*

				Male.			Female.			
	Jan.	Feb.	Mar.	J.	F.	M.	J.	F.	M.	Total.
1 *Endemic & Contagious diseases* Zymotic or Epidemic	292	204	174	158	108	93	134	96	81	670
2 *Uncertain or general seat,* Sporadic diseases	150	113	112	68	57	68	82	56	44	375
3 Nervous system	165	144	138	86	67	72	79	77	66	447
4 Organs of Respiration	262	206	203	136	95	99	126	111	104	671
5 " Circulation	35	24	25	19	10	14	16	14	11	84
6 Digestive organs	43	41	38	26	22	18	17	19	20	122
7 Urinary "	6	2	5	5	1	2	1	1	3	13
8 Organs of Generation	16	11	11		1		16	10	11	38
9 " Locomotion	5	4	7	2	3	6	3	1	1	16
10 Integumentary system	7		2	5		1	2		1	9
11 Old age	20	18	22	6	9	5	14	9	17	60
12 External causes	23	17	44	17	10	34	6	7	10	84
Still Born	61	53	49	35	28	27	26	25	22	163
Unknown	21	24	13	10	12	8	11	12	5	58
	1106	861	843	573	423	447	533	438	396	2810

TABLE NO. 2.

1. *Endemic and Contagious Diseases—Zymotic or Epidemic.*

	Male.	Female.	Under 1 yr.	1 to 2.	2 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to 110.	Total.
Cholera	1									1								1
" infantum	1	1	1	1														2
" morbns		3								1	2							3
Croup	46	39	20	14	44	6	1											85
Diarrhœa	5	3	2							1		1	3		1			8
Dysentery	6	4	3	1	2				1	1			2					10
Erysipelas	19	10	11	3	1	1		1	2	2	2	3	3					29
Fever,		1	1															1
" Bilious		3			1					1			1					3
" Congestive		1									1							1
" Nervous	1	1					1						1					2
" Remittent	2	2			1	1					1			1				4
" Scarlet	98	91	19	32	92	32	3	3	5	3								189
" Typhoid	21	18		3	2	4	5	2	2	4	8	4	2	2	1			39
" Typhus	9	6				2	1	1	5	1	2	3						15
Hooping Cough	9	13	9	3	10													22
Influenza		1		1														1
Measles	2	2	1	1	1	1												4
Small Pox	132	106	49	28	60	29	10	9	30	10	4	8		1				238
Syphilis		1							1									1
Varicella	2	1	3															3
Varioloid	5	4	2	4	1				1		1							9
	359	311	121	91	215	76	21	16	47	25	21	19	12	4	2			670

2. *Uncertain or General Seat—Sporadic Diseases.*

	Male.	Female.	Under 1 yr.	1 to 2.	2 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to 110.	Total.
Abscess	10	8	5	1	2			2	2	2	1	2	1					18
" Psoas	1									1								1
Anasarca	1	1	1							1								2
Cancer	3	18								2	2	13	2	2				21
Carcinoma		1									1							1
Consumption of Throat	1																	1
Cramp	1	3	3			1			1									4
Cyanosis	13	5	17			1												18
Debility	47	49	43	2	2					6	3	7	8	13	11	1		96
Disease of Neck	1		1															1
Dropsy	18	19	2	2	2	5	1		3	2	5	5	5	3	2			37
Gangrene	4	2			1				1	2		1			1			6
Gout	1												1					1
Hemorrhage	5	2	2		2			1		1	1							7
Inanition	31	19	44									3	1	2				50
Inflammation, Parotids	1														1			1
" Throat	3	2	1	1	1				1				1					5
" Tonsils		1		1														1
Malformation	4	2	6															6
Marasmus	32	31	32	11	9			1	2	2	1	1	2	2				63
Mortification	2	4		2							1		2		1			6
Osteo Sarcoma		1											1					1
Quinsy		1													1			1
Scirrhus	1									1								1
Sore Throat		2			2													2
Scrofula	7	2	2	1	2	1						3						9
Tabes Mesenterica	3	4	3	2	2													7
Tumour	1											1						1
Ulceration		2		1	1													2
" Mouth		1		1														1
" Throat	2	2	2			1		1										4
	193	182	164	25	26	9	1	5	10	20	15	36	24	22	17	1		375

3. *Nervous Diseases.*

	Male.	Female.	Under 1 yr.	1 to 2.	2 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to 110.	Total.
Apoplexy	16	12							1	5	5	7	6	2	2			28
Congestion of Brain	20	12	8	4	4	2	2	1	1	4	1	3		1	1			32
Convulsions	66	74	85	16	22	7	4		2		1	2		1				140
Disease of Brain	15	11	6		5	4	1				3	2	1	3	1			26
Dropsy "	30	29	24	16	12	4			2		1							59
Effusion "	11	10	9	4	5	1				1			1					21
Epilepsy	3	6		2					1	2	1	2	1					9
Hysteria		3							1	1	1							3
Inflammation of Brain	39	38	25	13	14	8	3	5	3	3	2	1						77
Mania	1	3								3		1						4
" a Potu	6	3							2	4	2	1						9
Palsy	13	18			1			1	3	3	3	1	7	7	3	1	1	31
Softening of Brain	4	3	1						1	2		1	1	1				7
Tetanus	1								1									1
	225	222	158	55	63	26	10	7	18	28	20	21	17	15	7	1	1	447

4. *Organs of Respiration.*

	Male.	Female.	Under 1 yr.	1 to 2.	2 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to 110.	Total.
Asthma	5	1	3	1	1											1		6
Apnœa	1													1				1
Congestion of Lungs	8	9	5	2	4	1		1		1		2	1					17
Consumption "	182	212	7	3	9	6	8	37	142	83	50	27	15	4	3			394
Disease of "	7	1	3	1						2	2							8
" Chest	2								1					1				2
Dropsy of "	10	6			1	5	1			4	1		1	1	1	1		16
Empyema		1							1									1
Emphysema		1							1									1
Effusion on Chest		1											1					1
Hemorrhage of Lungs	1	4						1	2	1	1							5
Inflamm'n of Bronchi	45	45	40	12	14		2		3	1	2	6	4	4	2			90
" Chest	2	1	1								1	1						3
" Larynx	9	2	2	2	2	1			1		1		2					11
" Lungs	56	55	32	11	14		3	6	12	9	8	6	7	1	1	1		111
" Pleura		2	1										1					2
" Trachea	1				1													1
Ulceration of Larynx	1				1													1
	330	341	94	32	47	13	14	45	163	101	66	42	32	12	7	3		671

5. *Organs of Circulation.*

	Male.	Female.	Under 1 yr.	1 to 2.	2 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to 110.	Total.
Anæmia	2	1	1	1		1												3
Aneurism	2									1	1							2
Angina Pectoris		1								1								1
Disease of Heart	35	31	1	2	3	3	2	2	5	8	11	11	11	5				66
Dropsy "	1	3			1							1	2		2			4
Enlargem't "	3	2		1	1		1			1			1					5
Pyohæmia		1									1							1
Syncope		1												1				1
Rupture of Blood-vessel		1				1												1
	43	41	2	4	5	5	3	2	5	11	13	12	14	6	2			84

6. *Digestive Organs.*

	Male.	Female.	Under 1 yr.	1 to 2.	2 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to 110.	Total.
Aphthæ		1	1															1
Carcinoma of Stomach	1											1						1
Cirrhosis	1												1					1
" of Liver	1											1						1
Cancrum Oris	2	1			2					1								3
Congestion of Bowels	1							1										1
Colic	3	1	2							1				1				4
Constipation		2	1										1					2
Consumption of Bowels	1	1	1						1									2
Disease of Abdomen	1		1															1
" Liver	3									1	1	1						3
" Stom. & Bowels	2	4	1		2							1	1		1			6
Dropsy of Abdomen	1	1								2								2
Hemorrhage of Umbilicus		1	1															1
Hernia	1	1	1										1					2
Hardening of Liver	1										1							1
Inflammat. Stom. & Bowels	24	19	7	4	3	3	2	3	6	4	4	3	3	1				43
" Liver	9	1			3	1	1			2	2	1						10
" Peritoneum	5	14			2			3	8	5			1					19
" Spleen		1							1									1
Intussusception	1	1					1			1								2
Jaundice	1			1														1
Obstruction of Bowels	4	1	1	1						1			1	1				5
Softening of Stomach	1	1										1	1					2
Sore Mouth		1			1													1
Teething	1	3	4															4
Ulceration of Bowels		1											1					1
Worms	1		1															1
	66	56	22	6	13	4	4	7	16	18	8	9	11	3	1			122

7. *Urinary Organs.*

	Male.	Female.	Under 1 yr.	1 to 2.	2 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to 110.	Total.
Diabetes	4							1				1	1	1				4
Disease of Kidneys	3	1							1	2					1			4
Hæmaturia		1							1									1
Inflammation of Kidneys	1	1			1				1									2
" Bladder		2									1				1			2
	8	5			1			1	3	2	1	1	1	1	2			13

8. *Organs of Generation.*

	Male.	Female.	Under 1 yr.	1 to 2.	2 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to 110.	Total.
Amenorrhœa		1							1									1
Cancer of Uterus		1											1					1
Disease of Prostate Gland	1														1			1
" Uterus		3							1	1	1							3
Fever, Puerperal		26						1	18	5	2							26
Hemorrhage "		1								1								1
" Uterus		3								1	1				1			3
Inflammation of Ovaries		1								1								1
" Uterus		1								1								1
	1	37						1	20	10	4		1		2			38

9. *Organs of Locomotion.*

	Male.	Female.	Under 1 yr.	1 to 2.	2 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to 110.	Total.
Caries of Spine	1					1												1
Disease "	3	2		1				1	1		1	1						5
" of Hip	1							1										1
Necrosis	1													1				1
Rheumatism	3	3			1		1		1		1	1			1			6
Softening of Spinal Marrow	1												1					1
Spina Bifida	1		1															1
	11	5	1	1	1	1	1	2	2		2	2	1	1	1			16

10. *Integumentary System.*

	Male.	Female.	Under 1 yr.	1 to 2.	2 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to 110.	Total.
Anthrax	2								1			1						2
Disease of Skin		1	1															1
Fistula	1									1								1
Lepra		1												1				1
Purpura Hemorrhagica	3	1	2						1	1								4
	6	3	3						2	2		1		1				9

11. *Old Age.*

Old Age	20	40											4	16	27	13		60

12. *External Causes.*

	Male.	Female.	Under 1 yr.	1 to 2.	2 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to 110.	Total.
Asphyxia	1								1									1
Burns	6	7		3	4				2	3		1						13
Casualties	29	4	1		1				12	10	4	2						33
Drowned	4	2					2	1	1	3	2							6
Exhaustion	2	2							2	2								4
Exposure	7	1	1							4	2	1						8
Fracture	2								1				1					2
Intemperance	6	2								3	3	2						8
Poisoning		2								1			1					2
Suffocation	1	2		1	1							1						3
Suicide	2	1							2		1							3
Wound	1												1					1
	61	23	2	4	6		2	1	21	26	12	7	3					84
Still Born	90	73	163															163
Unknown	30	28	24	1	3	3	1		4	4	7	6	2	3				58

TABLE NO. 3.

Deaths for the First Quarter of 1856, *at fifteen distinct periods of life*

Under 1 year,	591
1 to 2	219
2 to 5	380
5 to 10	137
10 to 15	57
15 to 20	87
20 to 30	311
30 to 40	247
40 to 50	169
50 to 60	156
60 to 70	122
70 to 80	84
80 to 90	68
90 to 100	18
100 to 110	1
	2647
Still Born	163
Total,	2810

Included within the above table were 182 from the Blockley Alms House; 138 Blacks; 2 from the County Prison, and 35 from the country, as follows:—

	Jan.	Feb.	March.	Total.
Almshouse,	73	49	60	182
Blacks,	58	39	41	138
County Prison,			2	2
Country,	9	4	22	35
	140	92	125	357

BIBLIOGRAPHICAL NOTICES.

The Obstetric Memoirs and Contributions of JAMES Y. SIMPSON, M. D., F. R. S. E., &c. Edited by W. O. Priestly, M. D., Edinburgh, &c., and Horatio R. Storer, M. D., Boston, U. S., &c. Vol. i.; Philadelphia, J. B. Lippincott, & Co., 1855.

Though many, distinguished by their literary and professional attainments, have vigorously opposed Dr. Simpson's theories and modes of practice, yet we believe that no one has ever disputed his talents, his zeal, or the rare ingenuity, originality and untiring energy by which he has placed himself in the front rank, if not at the very head of obstetrical science. No candid man can deny to him this honor, for he combines all the very rarest requirements of a great medical and surgical career; fearless, yet prudent, quick and sagacious, his reasoning, though seeming to border on temerity, has generally been fully justified and supported by the results of his practice. Thus impressed, we need hardly add that we hold ourselves and the profession in the United States as under great obligations to the gentlemen who have with so much skill and care collected and arranged the varied and interesting contents of this volume.

Dr. Simpson's obstetrical contributions, heretofore scattered through medical journals and transactions, have not yet, we think, in this country, received the careful investigation which they deserve. Particular articles, when wanted for reference, could not be readily found; hence the practical proof of the value of some of his suggestions is in a great measure still wanting. The work in question is therefore a most valuable addition to our obstetrical literature, and we have no doubt will be eagerly sought after by all reading medical men in the United States.

We will mention that the memoir on the construction and uses of the uterine sound, and its great value in the correct diagnosis of intra-pelvic diseases, is ably and clearly written, and proves that the author had given great care and attention to the subject. The majority of the profession is now fully impressed with its great usefulness; but the views of the originator on the subject, and his various illustrations of the manifold ad-

vantages which it affords to the investigator, will, we have no doubt, make it a very popular auxiliary to our other modes of determining the nature and extent of many obscure uterine diseases.

As we have heard it more than once objected to the use of this instrument, that it was dangerous on account of the irritation and even inflammation likely to be occasioned in so delicate and important an organ as the uterus, and having ourselves no experience in its use, we give Dr. Simpson's words on the subject of its effects:

"The degree of uneasiness felt by the patient during the passage of the instrument is in general very trifling, and not more, if so much, as is felt on passing the catheter along the urethra of the female, and certainly not by any means nearly so great as in using the sound or bougie in the male. In a few cases I have seen it, like the passing of the sound in the male, produce a feeling of sickness and nausea. In the healthy state, however, of the organ, the lining membrane of the uterus does not in fact appear to be more sensitive than that of the vagina, so that the existence of any true and actual pain in making the examination with the Bougie, is to be considered so far anormal, that it is generally, as we shall afterwards see, indicative of the existence of some morbid state or other of the part or parts with which the instrument is at the time in contact."

We have nothing to say against the use of such an instrument in proper hands, when, of course, it will never be used unnecessarily; but we fear that, like the speculum, its application will be terribly abused. Women are easily persuaded by a plausible charlatan, that they are laboring under some uterine disease, and in their terror they submit to manipulations which are more useful to the rascally operator's pocket, than to the libelled organ in question. We know a case where one of these respectable individuals recommended the introduction of the speculum to a young girl scarcely nineteen years of age, for a simple leucorrhœa. The family very properly dismissed him, and sent for a respectable physician of our acquaintance, who cured the so-called ulceration of the womb by the simplest means imaginable. The ease with which, as Dr. Simpson assures us, his sound can be introduced, will render it a capital travelling companion to the speculum.

In this brief notice it is impossible even to name a fraction of the various subjects discussed; but we naturally turn from the

uterine sound to one of a kindred nature, though we think of far more doubtful utility—we mean the intra-uterine pessary—for the modern application of which we are indebted to the extraordinary zeal and ingenuity with which our accomplished author appropriates and modifies every thing which can in any way contribute its assistance to his professional efforts. The instrument, its construction and application, are well described, but the keeping it in situ, as allowed by the Doctor himself, appears to be a somewhat difficult and troublesome affair; the external wire apparatus, bent over the pubis and supporting the internal portion of the instrument, by means of curvilinear tubes, locks, &c., &c., appears to us to be far too complicated to be of general practical utility. We have no doubt but that there may occur some cases of badly retroverted uteri, which may require such complicated machinery to keep them in place, though we have never been so unfortunate or fortunate, according to different tastes, as to meet with such. Dr. Lee, of London, made a savage onslaught upon this instrument, but the inventor clings to it very naturally with parental fondness. Its use will, of course, find favorers, and a sufficient experience, only to be gained by time, will doubtless ultimately lead to a just professional verdict on its merits.*

The article on the detection and treatment of intra-uterine polypi, is one of the most interesting in the collection. In cases of frequently recurring hæmorrhage, where the os uteri remains closed and the diagnosis doubtful, Dr. Simpson tells us that he is in the habit of opening the os by means of sponge tents, and has thereby frequently succeeded in discovering and removing intra-uterine polypi, which certainly, from the exhausted and anæmic condition of the patients, must have led to fatal consequences. He describes minutely the mode of preparing and introducing these tents. A well made tent generally takes from twenty to thirty hours to expand to its full extent, and dilates to four or five times the diameter it presented in its original

* In a late number of the London Lancet, (March 29th,) Dr. Henry Bennett states that "several fatal cases have occurred in England, and in Paris seven deaths from the use of the intra-uterine pessary have been published—the one of M. Amussat, which occurred in 1826, and six recent cases." Five of these were from acute peritonitis, one from secondary pelvic abscess.—Ed.

compressed state. One tent is often sufficient for all the purposes desired; but if not, a larger one is introduced, and so on until the womb is completely opened, when the operator can, with his finger, ascertain the condition of the whole internal surface of the organ.

Small, vesicular polypi, Dr. S. has often removed by avulsion; sometimes we know that they may be detached by the finger. The author prefers excision by knife or scissors to the ligature in all cases of large pediculated tumors. He makes light of the dangers of hæmorrhage, which have been advanced as an objection to this mode of practice, and says that it can always be controlled by the tampon. Indeed, after operating he always introduces one, which he suffers to remain twenty-four hours.

The process of excision is certainly rapid—the affair of a few minutes. The deligation of a uterine polypus is rather a succession of operations than one, and if the ligature be long in doing its work, as is sometimes the case, we may have great constitutional irritation to contend with, besides the horrible fœtor of a slowly putrifying mass, adding greatly to the misery and apprehension of the patient. "After an interval," observes Dr. Churchill, "varying from six days to three weeks, the canula will be found loose in the vagina and the stalk of the polypus severed.

Dr. Simpson makes the following remark on the subject:

"Those authors who have written in favor of deligation, usually quote one solitary case of death from hæmorrhage after excision, recorded by Zacutus Luzitanus, in the seventeenth century. It was an instance of the fact that the amount of attendant hæmorrhage is not regulated by thy mere size of the polypus; for in the case in question it is stated that the amputated polypus was not larger than an almond. In this instance the operation was performed by an empiric, and no plug or other means for arresting the hæmorrhage appear to have been employed. The patient died, not so much from the operation as from neglect of all proper means for arresting the hæmorrhage resulting from it."

"But the principal danger to health and life in this, as after other surgical operations, is the danger of phlebitis and surgical fever. Is such a consequence more likely to follow upon the instantaneous resection of the peduncle of a polypus and its subsequent immediate removal, or is it more likely to supervene upon the slow process of disjunctive ulceration being set up in the stalk of the polypus by the ligature, while

the gangrenous mass itself is left decomposing in the cavity of the vagina?"

The article on the subject of the operation of ovariotomy, is not written by Dr. Simpson, but is a report by the editor of the Edinburgh Monthly Journal, of his opinion of that proceeding, delivered before the Medico-Chirugical Society of Edinburgh, on the 17th of December, 1845, in which it is stated that Dr. S. expressed his conviction that he believed ovariotomy quite unjustifiable in many of the cases in which it had been had recourse to, while at the same time, he proved by statistical tables, that it is not more fatal than other capital operations.

The report likewise informs us, that the Doctor is of opinion that by means of the uterine sound and a careful manipulation, a correct diagnosis between ovarian and fibrous tumors of the uterus may always be attained, thus removing one of the great objections to the undertaking. He is likewise represented as recommending the use of exploratory needles, to ascertain in doubtful cases the nature of the contents of these tumors; that he believed the chief difficulty at this moment is assuredly that of discovering the existence or not of adhesion of the tumors by false membranes, their extent, &c., that if this point could by any means be cleared up, it would remove one of the great, perhaps the greatest, existing objections to ovariotomy.

But of the mode of accomplishing this we are left totally in the dark. The author, we are told, assures his audience of what in all probility the profession in Edinburgh knew before, viz: that modern pathology has made wonderful advances, and that physical diagnosis may, at some future period, help us out of the difficulty; that some of our domestic animals enjoyed a remarkable impunity from the coarse operations of spaying; that, as proved by the Cæsarean section on the continent, the peritoneum took more kindly to cutting than was at one time supposed, but still that extreme dread of all such abdominal surgery was, and probably is, the prevailing idea. This last statement is to us, we confess, extremely gratifying, and we are pleased to be able to record the fact, that this eminent authority thinks it somewhat cruel and even discreditable to cut a woman open on an uncertainty.

Turning as an alternative for craniotomy and the long forceps

in deformity of the brim of the pelvis, is a long and elaborate essay, originally presented by the author to his pupils, in 1850. It is admirably illustrated by cases and diagrams, and the mechanical advantages of the practice clearly explained; but as we could not pretend to give any idea of the merits of the article without making long extracts, for which we have not room, and as it has been long before the profession, we satisfy ourselves by recommending it as a study to those who may be interested.

Of the long and elaborate treatise on placenta previa, we are not called upon to speak; the subject has long been in consideration by the profession, and Dr. Trask's admirable prize essay has given us the results of all modes of treatment, in copious and carefully prepared statistical tables. In reviewing these, it appears, that in certain cases, that is, when the hemorrhage is great and the close and rigid contraction of the os uteri forbids immediate delivery by turning, the propriety of Dr. Simpson's proposition to detach the whole placenta is sustained.

To conclude, we have no hesitation in asserting, that we think this one of the most interesting and instructive books we have ever read; and though the author differs from many preconceived notions of his professional confréres, yet there is preserved throughout every article, a tone of courtesy and respect when speaking of the opinion of contemporaries, which makes the reader entirely forget that some of these gentlemen were and are his fierce opponents. We cannot but commend the spirit which dictated such a course; and cannot help expressing a regret that the Boston Editor should, in his preface, have forgotten, in his enthusiasm for Dr. Simpson's cause, the precept and even the expressed request of his instructor, by impugning with unseemly bitterness the motives which induced Dr. Lee, of London, to enter the lists against his friend; Dr. Simpson had the sagacity, as well as the modesty, to see, that a sarcastic depreciation of others is not the true path to the temple of fame, and even if he felt that some one had opposed him with unfairness, his admirable motto was, "let bygones be bygones." We think his well wishers would have better served his dignity by having the good taste to say, "so be it."

Physical Exploration and Diagnosis of Diseases affecting the Respiratory Organs. By AUSTIN FLINT, M.D., Professor of the Theory and Practice of Medicine in the University of Louisville, etc.

In noticing any new volume on a subject upon which numerous works have been published, it is perhaps best to suffer the author to appear in his own introduction:

"The few special treatises which have more recently appeared, are mostly designed as manuals for the medical student." . . . . .

"My aim has been to supply what appears to me a desideratum, viz., a work limited to diseases affecting the respiratory organs, treating *in extenso*, and almost exclusively, of the principles and practice of physical exploration as applied to the diagnosis of these affections. So much, briefly, for the motives and objects which have prompted the undertaking."

In a treatise of this kind, of course, much must have been gathered from the writings of others; yet the work before us is not deficient, either in original thought or observation. We proceed to notice those subjects which seem to have been specially studied by Dr. Flint.

Percussion.—The appreciation of the results of percussion in disease must be based upon our knowledge of the sounds a healthy chest yields when struck. The fact that we are aware, that such, or such a part of the chest, ordinarily sounds clear, or dull on percussion, does not aid us in individual cases; it is the comparison between the two sides on which we base, or, at least, ought to base our diagnostic conclusions. To determine, then, to what extent disparities exist in health between the two sides of the chest, must be a matter of great practical importance; and this is one of the points to which Dr. Flint seems to have paid particular attention.

In the post-clavicular regions, percussion does not produce uniform results, on account of the impossibility of applying the finger, or the plessimeter, equally on both sides. This should, therefore, make us very careful in attributing any slight differences in this region to a morbid condition. Over the clavicles a disparity frequently exists in healthy chests, and there also slight differences should not be considered as abnormal. In the infra-clavicular region, Dr. Flint detected a very frequent dis-

similarity between the two sides. The sound, on percussion, had generally a clearer or, as it is called, a more "vesicular" character on the left side, and was lower in pitch. At the summit of the chest, behind—the *scapular* region,—there was less disparity of sound, although even here the pitch was higher on the right than on the left side. The important bearing of these observations is obvious, especially for the recognition of tubercular disease. We should feel, however, more confidence in the results, if the observations had been made on a more extended scale than the number indicated (20) would imply; as, moreover, in eight out of these the percussion sound was, "in all respects, equal on the two sides in the region first indicated." In several other regions of the chest equal diversities were observed between the two sides. The whole chapter, indeed, involving the differences in healthy percussion, we recommend as worthy of attention.

Percussion, as applied to disease, Dr. Flint studies under four heads: 1. Exaggerated vesicular resonance. 2. Diminished vesicular resonance. 3. Absence of resonance or flatness. 4. Tympanitic resonance. This latter resonance is almost always accompanied by a rise in the pitch of the sound. More importance is indeed attached throughout by Dr. Flint, to the differences in pitch, than is done by most authors. Skoda declares that changes in this respect are not entitled to much value in practice. Walshe mentions the differences in pitch and illustrates them by the difference of the heart and liver sound *in situ*, yet he attributes to the pitch of the sound but little diagnostic import. The author before us believes the pitch of sound to have been much neglected.

"A variation in pitch by one who has what is called a 'musical ear,' is more easily recognized, than a slight disparity in the amount of resonance; and in some instances the former may be distinguishable without difficulty, when the latter is inappreciable. In cases, therefore, of suspected tuberculosis, it is important to compare the sounds on the two sides as if they were musical notes, in order to determine whether they are in unison, or differ in their diatonic relation to each other. A difference in pitch may then be the only discoverable evidence of dissimilarity, and, in connection with other signs and symptoms, may be entitled to considerable weight in the diagnosis. The importance of attention to the pitch of percussion-sounds, with a view to greater nicety and accuracy of discrimination, seems to me not to have been sufficiently appreciated by most writers on the subject of physical exploration."

Under the head of the tympanitic sound are embraced the amphoric and the cracked metal sound. This latter is almost always associated with a cavity communicating with a bronchus. Dr. Stokes, in his work on Diseases of the Chest, mentions nevertheless the fact of its occurrence in cases of bronchitis with effusion. We have ourselves seen this sound produced in children by a strong and rapid percussion without any evidences of consolidated or excavated tissue existing. Dr. Flint cites two instances of this sound without any cavity having been found after death.

Auscultation is undoubtedly a more popular method of physical exploration than percussion. It requires less skill to hear sounds, than tact and practice to produce them. The sounds, on application of the ear, are with a little attention soon recognized; their mechanism and the causes of their production are the points that baffle. Auscultation, when its object is to isolate sounds, is best performed by means of a stethoscope. Of stethoscopes, there is every variety of shape and form. The flexible stethoscope recently invented by Dr. Cammann, of New York, has been extensively used by Dr. Flint, and he expresses himself much satisfied with the result:

"In making trial of the instrument, I have found it more difficult to institute comparisons as regards quality and pitch of sound than with the ear alone, or the ordinary stethoscope; but with reference to differences of intensity, and in rhythm, it admits of a wider application than the common modes. It renders distinctly audible, also, morbid sounds in some instances in which they are too obscure to be studied satisfactorily without its aid. For comparison of the two sides of the chest, as respects the resonance produced by the act of speaking, it is exceedingly well adapted." (p. 131.)

"In cases of suspected tuberculosis, in which tuberculous deposits are either wanting, or are small and disseminated, by means of this stethoscope a closer comparison of the respiratory sounds can be made than with the ordinary cylinder or the naked ear. A disparity, therefore, on the one hand, is in some instances rendered appreciable which otherwise would not be discovered; and, on the other hand, the absence of a disparity, and the completeness of the normal characters, are more satisfactorily determined than is always practicable without this improved means of auscultatory exploration. It enables the auscultator to study the characters of the respiration in some cases in which it is so feeble as to be with difficulty appreciated by the ordinary cylinder or by immediate auscultation. Its usefulness in cases in which it is desirable to

make nice comparisons with respect to vocal phenomena, is not less than in examinations with reference to respiratory sounds." (p. 485.)

The greatest draw-back we have noticed to its use is the intensity it gives to any sound produced by the friction of the stethoscope against the clothing, or even against the walls of the chest; a circumstance which undoubtedly interferes with an accurate appreciation of the intra-thoracic murmurs.

The sounds of respiration require as much as the sounds of percussion, to be first studied in the healthy chests. They are divided by some authors according to their character; by others, according to the anatomical situation of their production. Dr. Flint distinguishes a tracheal, a bronchial and a vesicular respiration. The tracheal is tubular in quality, high in pitch; the inspiration and expiration are separated by an interval. In the larynx, according to Barth and Roger, its character is altered; such is not, the opinion of Dr. Flint. The bronchial murmur is heard near the sterno-clavicular articulation and in the interscapular space; it is high in pitch and consists mostly of an inspiratory and expiratory sound. In 24 examinations it existed anteriorly in the act of inspiration only, twelve times; its intensity (p. 143) is rather greater on the right side.

The vesicular respiration is mainly an inspiratory murmur; the expiration is absent in about one-third of the cases. It is lower in pitch than the inspiration, always shorter than this sound, and feebly tubular or blowing.

The vesicular sound is, as first pointed out by Dr. Gerhard, of unequal character on the two sides of the chest. Dr. Flint has found in the infra-clavicular, or "tubercular regions," if we may be permitted to use that expression, the inspiration on the right side less intense and less markedly vesicular, although of a higher pitch than on the left side; the expiration more prolonged and intense, and of a higher pitch than the sound of inspiration.

Comparison of Right and Left Infra-clavicular Regions. Whole number of examinations twenty-four.

Inspiratory Sound.

Right.	*Left.*
Greater intensity in one case.	Greater intensity in 15 cases.
Vesicular quality more marked in no case.	Vesicular quality more marked in 14 cases.
Higher pitch of sound in 12 of 19 examinations.	Higher pitch of sound in no case.

Expiratory Sound.	
Right.	*Left.*
Present on this side, and not on left side, in 3 cases.	Present on this side, and not on right side, in no case.
More intense on this side in 2 cases.	More intense on this side in no case.
Prolonged in several cases.	Prolonged in none.
An interval between the sounds of inspiration and expiration in several cases.	The two sounds continuous.
Pitch higher than that of the inspiratory sound in 11 instances.	Pitch higher in 1 instance.
Pitch lower than that of inspiration in 4 instances.	Pitch lower in 10 instances.

The resonance, further, of the *voice* was noted in the same region as greater on the right side in 19 out of 23 examinations.

In looking over the pages treating of Auscultation in Disease, we observe that the term bronchial-respiration is made to embrace the bronchial and blowing respiration of Walshe. Rude respiration, which of all modifications of the respiratory murmur is the most difficult to determine, is, we think, very happily described as broncho-vesicular respiration. Dr. Flint sums up its character as "*Inspiration* presenting vesicular and tubular qualities mixed; shortened in duration; pitch raised; intensity variable; sometimes alone present. *Expiration*, oftener present; frequently existing alone; prolonged; occurring after an interval; pitch higher than that of inspiration and oftener more intense."

The difference between bronchial and cavernous, denied by some of the best auscultators of the day, consists, according to Dr. Flint, in the blowing character, low pitch and slow evolution of the sound; also in its feeble expiration, the pitch of which is even lower than that of inspiration.

The râles are described as bronchial, vesicular, cavernous, and indeterminate. In the bronchial râles, why distinguish between fine mucous râle and subcrepitant? Where is the line of division to be drawn? Again, we do not see why, in the table exhibiting the diagnostic indications of the different râles, mucous râles confined to one side of the chest should be indicative of secondary bronchitis, an affection frequently met with in typhus and typhoid fever, and with râles (as often dry as moist) as much diffused over the chest, as in primary bronchitis. We have turned to the chapter on Secondary Bronchitis for information, but meet with no further explanation of the statement.

The phenomena of the *voice* are described under four heads, Exaggerated, Vocal, Resonance and Bronchophony; diminished and suppressed vocal resonance, pectoriloquy including amphoric voice and egophony. This last named sign Dr. Flint regards as rare: Pectoriloquy is used under the signification of transmitted voice, without any reference to cavities: in the Appendix it is stated, that if in "whispering" pectoriloquy the souffle accompanying the act of whispering be of a low pitch, this is indicative of a cavity.

The theory of Skoda, with regard to the transmission of the voice being dependant upon consonance, is decidedly rejected. The arguments advanced are mainly the same as those in the second edition of Walshe, p. 142, *et seq.*

In part II, which embraces nearly 300 pages, the separate diseases are considered. In this part we confess, at first sight, to have been somewhat disappointed. It seemed to us, in many respects, as more of a compilation of the opinions of others than the first part, but it gains on repeated perusal. The remarks on diagnosis are mostly characterized by care, and evidently worked out *con amore.* We shall only notice some of the more salient points, and refer the reader to the work itself for a description of the individual diseases.

Acute lobar-pneumonia, or *Pneumonitis*, presents marked physical signs, by which its different stages can be detected. On this point observers agree; but with regard to the relative frequency and importance attached to separate signs, opinions are not as unanimous. The crepitant râle was considered by Laennec as pathognomic of the first stage; many of the more recent clinical teachers, Chomel, Cruvelhier, Skoda, deny its frequency and pathognomic import. Grisolle, on the other hand, in 373 cases of acute pneumonia, only found it altogether absent four times. Flint states, that out of 44 cases, a crepitant râle was marked in 32; in twelve its presence was not noted. This difference in opinion may, we think, be reconciled by assuming, that nearly each physician has formed his own type of a crepitant râle. Some adhere strictly to the description of the râle as given by Laennec, others include more or less all the finer bubbling sound under the name crepitant. Skoda admits as much when he says, (Am. edit. p. 157.) "moreover, I have not only

not found this crepitation constantly present in pneumonia, but if we are to follow Laennec's description of it *very closely*, (the italics are our own,) I must say that I have not often observed it."

In the second stage, or that of consolidation of tissue, dulness on percussion, bronchial respiration, and broncophony are generally met with. In two out of twenty-seven cases observed by Dr. Flint, words were transmitted (pectoriloquy); in several instances (contrary to the opinion expressed by Walshe) "whispering voice" was observed. On the puff or *souffle*, accompanying the act of whispering ("whispering bronchophony,") Dr. Flint lays considerable stress. It is generally of an acute and high pitch, and constitutes an important sign of solidification. He also notices the line of demarcation between the healthy and solidified lung, which if the inflammation, as it generally is, be confined to one lobe, will be found "in a direction coincident with the inter-lobular fissures." We are not aware of this fact having been elsewhere noticed.

"Thus if the lower lobe be affected, the line intersecting the several points at which the change in the percussion-sound is observed, extends obliquely upward and outward, from between the fifth and sixth ribs, in a direction towards the vertebral extremity of the spinous ridge of the scapula,—this being the situation of the fissure separating the upper and lower lobes on the left side, and the middle and lower lobes on the right side. On the right side, in cases in which the inflammation extends to the middle lobe, the line pursues a direction upward and outward from the fourth cartilage. This is a point not only of interest, but one which may be in some instances of improvement in diagnosis. In the absence of the auscultatory phenomena distinctive of solidification of lung, which, although generally present, may yet be absent, the question will perhaps arise whether marked dulness or flatness on percussion be not due to liquid effusion; in other words, the differential diagnosis between pneumonitis and pleuritis is to be made. Now, if under these circumstances, the line denoting the limits of the dulness and flatness be found to occupy the situation of the interlobular fissure, while the body of the patient is in a vertical position, the question may be considered almost or quite settled." (p. 407.)

We shall not enter into a synopsis of the chapter on *Pulmonary Tuberculosis.* The physical signs are mainly illustrated from an analysis of one hundred cases; the dulness in most was at the apex, and sufficiently well-marked. Yet even with complete and considerable solidification at the summit of the chest, an abnormal clearness was occasionally noticed. It is extremely difficult to ex-

plain this apparent anomaly, excepting, perhaps, by adopting Skoda's theory with regard to the production of tympanitic sound. (Op. cit. p. 47.) In appreciating the relative amount of dulness, the importance of the observations, already quoted, on the disparity in the character of the percussion sounds between the two sides of the chest in healthy persons, becomes apparent.

Pulmonary Œdema; Gangrene of the Lung; Pulmonary Apoplexy; Cancer of the Lungs; Cancer in the Mediastinum, are next discussed. We find here nothing new or deserving of special notice.

Pleurisy, and the diseases connected with it, have evidently been studied with much care: especially may this be said of chronic pleurisy, on which Dr. Flint is the author of a valuable monograph. The signs of an effusion in acute pleurisy are mostly well-marked, and the affection presents but little difficulty in diagnosis. Flatness on percussion, absent voice, and vocal fremitus, feeble or absent respiration, constitute an almost pathognomic series of physical signs. Above the effusion the percussion sound is very clear, even tympanitic. Dilatation of the affected side, and displacement of the viscera and of the diaphragm, are secondary consequences; to these Dr. Flint adds a sense of fluctuation appreciable by palpation.

Yet all cases do not prevent these marked signs; in some—fortunately rare cases—a bronchial respiration is heard all over the lung, as in consolidation, whilst the voice, instead of being absent, is transmitted to the ear. The diagnosis of pleuritic effusion becomes now of greater difficulty. The vocal fremitus is is too unreliable to be trusted. The general symptoms, the mensuration of the chest, with a careful comparison of the sounds in the upper portion elicited by percussion, have more especially to guide us to a conclusion. Dr. Flint mentions the occurrence of these exceptional variations, but merely says that attention will in all such instances develop ample data for the discrimination.

The symptoms of chronic pleurisy are generally slightly increased respiration, night-sweats, pulse more or less accelerated, and in a large proportion of cases not any great loss of weight or emaciation. The strength is sometimes preserved in an astonishing degree. None of these symptoms are conclusive

without the physical signs, as the affection sometimes occurs in a very latent manner, and is frequently mistaken for affections of other organs. In Dr. Flint's Clinical Report on Chronic Pleurisy, Buffalo, 1853, the errors of diagnosis in 18 cases are numerically stated. In four the disease had been treated as latent intermittent fever; in four the disease was supposed to be phthisis; in three the patients were presumed to be laboring under continued fevers; whilst the other seven cases divided amongst them the diagnosis of disease of the heart, liver complaint, hepatization of the lung, general debility, etc. (See op. cit. p. 26.) In this disease, therefore, physical signs become of paramount interest. Now the physical signs are mainly those of acute pleurisy in the stage of effusion; the flatness generally extends from the bone of the chest upwards; the voice and the sound of respiration are absent. Whether the effused fluid be pus (empyema) or serum cannot clinically be ascertained.

To determine if chronic pleurisy have existed at any previous period, may become a question of practical importance. On this subject, the observations in the volume before us are of the highest interest and novelty, and the reader must pardon us for reproducing the entire passage in which the characters involved in the "retrospective diagnosis" are noted. The results were arrived at by the examination of fifteen patients, at periods varying from ten months to ten years from the date of the attack, and are thus summed up:

"Diminished width of the chest, apparent on inspection in the great majority of cases. Depression or flattening at the summit of the affected side, almost invariably observed; but occasionally enlargement, which probably denotes abnormal dilatation of the cells, or emphysema. The reduction in size also shown by mensuration. The shoulder generally depressed; but in some instances this is not apparent, and it may be even raised above the level of that on the opposite side. The nipple usually depressed, but not invariably, and nearer the median line. The lower ribs converging, sometimes almost overlapping; the upper ribs diverging. The distance from the posterior margin of the scapula to the spinal column lessened, often in a notable degree; an exception to this rule obtaining, in some instances, when lateral curvature of the spine takes place, the concavity looking towards the affected side. Projection of the lower portion of the scapula, occurring in a certain proportion of instances; and, also, depression of the inferior angle below the level of that on the opposite side. The respiratory movements almost uniformly diminished in a degree more or less marked; the ex-

pansibility on the opposite side being, at the same time, exaggerated. Comparative dulness on percussion; the contrast rendered more striking by the great clearness of the percussion-resonance on the opposite side. A vesiculo-tympanitic resonance at the summit, conjoined with enlargement, denoting the supervention of emphysema. Feebleness of respiratory sound over the entire side, with few exceptions; and on the opposite side, an unusually intense vesicular murmur. A bronchial respiration sometimes observed in the interscapular space, and in other parts of the side. In the latter, especially if associated with bronchophony, probably denoting dilatation of the bronchial tubes. The respiration, in a certain proportion of cases, broncho-vesicular. The vocal resonance sometimes greater, but not uniformly. The same remark applicable to fremitus. Curvature of the spine in some cases, the inclination usually lateral, the concavity toward the affected side. The position of the heart frequently normal, but in some instances displacement of this organ; it being found to the left of its natural position and elevated, if the pleuritis be seated in the left side.

"It will be borne in mind that this summary embraces characters observed in persons after complete recovery from chronic pleuritis, and presumed to be entirely free from any existing pulmonary disease, excepting, in some instances, emphysema and dilatation of the bronchial tubes." (p. 577.)

Remarks on Pneumothorax, Pleurodynia ("Pleuralgia") and Foreign Bodies in the Air-passages conclude a work, of which we cannot but admire the spirit that has presided over its composition. There is an evident accuracy aimed at throughout, by means of the carefully noted cases, and a searching after truth which recommends the volume highly to the attention of the profession. On some subjects Dr. Flint's subsequent *data* may lead him perhaps to modify some of his observations, or to substitute for the descriptions of others his own experience; but the whole character of the work is such, that it cannot fail to raise him high in the opinion of his medical brethren, as an exact and most conscientious observer.

Transactions of the American Medical Association. Vol. viii., 1855.

The Report of the Commitee on the Hygrometrical state of the Atmosphere in various localities, and its influence on Health. By Sanford B. Hunt, M. D.

The effect of the different states of the atmosphere upon the health of man is a problem daily increasing in interest, not

only to the scientific medical practitioner, but to all who desire to increase the happiness of the human race. It is well known that the tendency to certain diseases is far greater in some seasons than in others; and the inquiry has often been made whether the extraordinary prevalence of those diseases is owing to the state of the atmosphere alone, or to what has been called "*terrene causes*," such as filth, exhalations from decaying vegetable matter, or stagnant water, or to both of these causes combined. That such an inquiry possesses considerable interest, we are all ready to acknowledge. It is interesting, not only as leading to the discovery of a long hidden truth, but also in its results; for if the true causes of those diseases can be clearly ascertained, they may, to a great extent, be prevented, or at least ameliorated in their effects. If owing to the state of the atmosphere, we may to a certain extent guard against its effects; if to terrene causes, an active sanitary police may prevent their existence, or remove them as soon as they are discovered. In the prosecution of this inquiry, however, we are hindered by the extreme complexity of the elements, and the difficulty of arriving at an accurate or reliable knowledge of their effects. We know not whether the effects of the weather should be attributed to the pressure of the atmosphere, the influence of prevailing winds, the heat, dryness or humidity of the air, or to all of them combined. Besides, the science of meteorology is still in its infancy; its literature is scattered and imperfect, and even the method of ascertaining the most essential conditions are yet unsettled, different methods being in use by different observers.

These difficulties being obvious to the members of the American Medical Association, they acted wisely in endeavoring to isolate one atmospherical condition, and to trace its effects, first, separately, and then when combined with others acting with and upon each other and upon the health and life of man. The subject of the "Influence of the Hygrometrical condition of the Atmosphere on Health," was accordingly assigned to Dr. Hunt, of Buffalo, by whom the Report before us was made.

In this paper the subject of Humidity in connection with heat, and its effects when combined with other causes, in inducing certain diseases, is very forcibly, clearly and logically treated,

and in many of its results illustrated by facts occurring under the observation of the author.

He begins by asserting that, "in all calculations of the humidity of the atmosphere, the *dew-point* is the essential condition, as it indicates the point to which the atmosphere is saturated with moisture, all between that and the temperature being a margin for the absorption of vapor." The method of ascertaining the dew-point is next explained, and some of the most important causes of its variation pointed out. Attention is next directed to the relative humidity of different regions of the United States, and the conclusion reached, that the greatest "humidity will be formed at low altitudes open to south-west winds;" and that "the relative humidity of the atmosphere will decrease with the increasing altitude of the place examined, with its protection from the south-west wind, and with its exposure to polar breezes. These are the great conditions which apply to all parts of our country. Disturbing local causes will vary, while they confirm the exactness of the rule."

Having established the general laws of *humidity*, as they are found to exist in different parts of the United States, he next proceeds to trace the connection between a *deficiency* or *excess* of humidity upon the health of an individual. In all his reasoning he very properly considers the *fraction* of *saturation*, or the fraction which the moisture existing in the atmosphere bears to that which would constitute saturation, as the essential condition. He shows that it is not probable that a mere deficiency of humidity can exert any direct, or, at least, immediate effect upon health; and that probably the mere fact of a high dew-point is not sufficient to cause disease, if the fraction of saturation be low, and a wide margin consequently left for evaporation. The effect of a high dew-point combined with a high fraction of saturation is next considered, and shown to be sufficient to cause "certain diseases marked by simple loss of tone, but is not sufficient *of itself* to produce zymotic or epidemic diseases." "But it is nevertheless very certain, that the combination of high heat and humidity is one of a series of causes, having a direct influence upon the prevalence and fatality of epidemics when once established. The *inception* is due to a special cause, of which we are ignorant; its *progress* depends largely upon the relative

humidity of the air." When we find a *high dew-point* combined with *terrene causes*, such as filth, or some upheaval of the soil, cleanly or dirty, then the cholera or yellow fever follows. One of these, the terrene causes, for example, may exist without epidemic disease, but its development into an actual epidemic will take place as soon as a high dew-point is supervened. The two causes, in order to produce the dreaded effect, must act together. In fine, Dr. Hunt concludes his most valuable paper by summing up his reasoning in the following words:

"It is proven that certain epidemic diseases are materially modified by *ærial* causes; that these causes alone are not sufficient for the actual production of true zymotic disease, or any other effect save nervous exhaustion; that, combined with the *terrene* conditions, they exert a direct, marked and fatal influence upon epidemics, and that these causes are separable; the the terrene condition being removable by the judicious exercise of the sanitary police, and the ærial causes being avoidable by hygienic measures, based upon a knowledge of the habitudes of aqueous vapor at ordinary temperatures."

Our deep interest in a subject which may in a few months be of such vital importance, has already led us to exceed our limits, and we must conclude by recommending to the attention of all this intensely interesting and important paper.

A Practical Hand-book of Medical Chemistry. By JOHN E. BOWMAN, F. C. S., Professor of Practical Chemistry in King's College, London. *Second American from the Third and Revised Landon Edition. With Illustrations.* Philada. Blanchard & Lea. 1856.

This admirable little work cannot but prove a valuable guide to all who desire instruction in the proper mode of analysing the blood, urine and other products of the human body. Practical directions for detecting poisons in organic mixtures and in the tissues are also given, which will be found very useful to all who desire information on such matters. All the recent discoveries in medical chemistry have been added to the present edition, thus placing it in advance of the previous works upon the same subject.

The Principles of Surgery. By JAMES MILLER, F.R.S.E., F.R.C.S.E., &c. *Fourth American from the Third and Revised English Edition. Illustrated by Two Hundred and Forty Engravings on wood.* Philada. Blanchard & Lea. 1856.

The high estimation in which Prof. Miller's "Principles" are held throughout England and our own country dispenses with the necessity of saying anything more of the present American edition than that it is a transcript of the third and revised English one. We can strongly recommend it to our readers as a most useful and desirable work.

THE MEDICAL EXAMINER.

PHILADELPHIA, MAY, 1856.

MEDICAL NEWS.

MEDICAL SOCIETY OF THE STATE OF PENNSYLVANIA, SESSION 1856.—The next session of the Medical Society of the State of Pennsylvania will be held in the city of Philadelphia commencing on Wednesday, May 28th, 1856, at 11 o'clock, A. M.

Delegates who arrive in the city on the preceding day are requested to report themselves on the afternoon of that day between 4 and 6 o'clock at the Hall of the College of Physicians, Spruce St. between 8th and 9th. The building to be occupied by the Society during its session will be designated in the papers of the day.

Reports and communications to be laid before the Society may be sent in advance to either of the Recording Secretaries.

HENRY CARPENTER, Lancaster.
ALFRED L. KENNEDY, Philada.

The following list comprises the graduates of our different Colleges during the last session, all, at least, that we have noticed in our exchanges. University of Pennsylvania, 140; Jefferson College, 215; Pennsylvania College, 37; Philadelphia College of Medicine, 19; University Medical College, N. Y., 97; New York Medical College, 32; College of Physicians and Surgeons, 39; University of Buffalo, "several;" Memphis Medical College, 11; Dartmouth College, 15;

Rush Medical College, 42; Medical College of Ohio, 17; Medical College of South Carolina, 85; Miami Medical College, 18; Cleveland Medical College, 38; Massachusetts Medical College, 28; Stearling Medical College, 20; University of Nashville, 85; University of Michigan, 30; University of Missouri, 28; St. Louis Medical College, 50; University of Louisiana, 65; Medical College of Georgia, 73; Medical College of Savannah, 12; Oglethorpe Medical College, 8. Total 1204, 411 of whom graduated in Philadelphia.

We ask the attention of our readers to Dr. Durkee's Case of Erythema Tuberculatum et Œdematosum, which will be found in the "Record" of this number. It contains a very admirable and particular account of a rare and maliguant affection of the skin, but slightly mentioned by most dermatologists. We regret that our limited space will not permit us to extract the entire article.

We have received four numbers of the Cincinnati Medical Observer, edited by Geo. Mendenhall, M. D., J. A. Murphy, M. D., and Edward B. Stevens, M. D.; and two numbers of the Medical Independent, published at Detroit, and edited by H. Goadby, M. D., Ed. Kane, M. D., and L. G. Robinson, M. D. Both Journals give evidence in their pages of being well edited, and we willingly enter them upon our list of exchanges.

We are indebted to Dr. Betton, one of the Trustees of the State Lunatic Hospital at Harrisburg, for a copy of its fifth annual report. The report states that at the beginning of the year 1855 there were 214 patients in the Hospital, since which time 164 have been received and 128 discharged or died, leaving 250 under care. Of the discharged 26 were restored, 30 improved, 43 stationary, and 29 died. The highest number in the Hospital at any one time was 264.

For the proper working of the Institution during the present year, the board ask an appropriation from the State of $33,000. They also renew their suggestions for providing another State Institution west of the Alleghenies, as the present Hospital will soon prove incompetent to meet the demands upon it from the central and eastern parts of the State.

The French Academy of Science has conferred the prize of "Experimental Physiology" upon Dr. Brown Séquard, for his researches upon the Physiology of the Spinal Cord.

Dr. Chauncy Booth has been appointed Superintendent to the McLean Asylum, in place of Dr. Luther V. Bell, resigned.

RECORD OF MEDICAL SCIENCE.

Case of Erythema Tuberculatum et Œdematosum.

[Read before the Boston Society for Medical Improvement, by S. DURKEE, M. D.]

Patient, Mrs. Capen, of South Boston. Age, 47 years. Born of healthy parents, and always lived in Massachusetts. Was married at the age of 19, and was the mother of six children. They are all living but one, which died at the age of four months. Her mother is still living, at the age of more than 70 years. Her father died at sea of an injury.

Patient was above the medium size, stout built, dark complexion, black hair, black eyes ; temperate, and otherwise of good moral character. Never had any unusual trouble connected with child-bearing, nor any catamenial derangements worth mentioning. She first consulted me about the middle of July, 1855. There was then one tubercle situated on the inside of the left leg, midway between the knee and the ankle. It was one inch in diameter at the base, and elevated one third of an inch above the surrounding skin. It was of a deep red color, was perfectly round, and slightly elastic to the touch. It was not painful. It began to show itself in the month of March previous, making about four months before I saw it. There were from eight to ten papulæ irregularly distributed in the immediate neighborhood, and varying in size from mere dots to a pin's head ; and two or three small tubercles of the bigness of a split pea near the inner malleolus. The appearance of the papules and the tubercle corresponded with the description and plate which may be found under the head of Erythema papulatum et tuberculatum in the " Illustrations of Cutaneous Diseases," by Robert Willis, London, 1841.

The leg and foot were somewhat swollen and œdematous. The general health was impaired. The woman had a poor appetite ; looked thin and pale ; and complained of severe constipation and debility. Pulse 65 and feeble.

She stated that on the 4th of March, 1853, her right thigh was amputated in consequence of a disease on the right leg like that which occupied the left leg at the time I saw her in July. Both legs and feet had been more or less swollen, especially in warm weather, for six or seven years previously to the amputation. The tubercles on the right leg had existed eight months before the surgical operation was performed. Tney were fused together in one large mass, according to the patient's statement, and covered a portion of integument on the middle of the leg nearly as large as her hand. She had a favorable recovery from the operation, and for eighteen months afterwards enjoyed health. The malady never showed itself in the stump. The left leg was free from disease at the time the thigh was removed.

Such is the report furnished by the patient at my first interview with

her. Circumstances beyond my control prevented me from seeing her again until

Sept. 29, 1855.—At this time I visited her with her medical attendant. Found the foot and leg more swollen and œdematous than when I saw her in July ; and more than one hundred papules and tubercles were developed upon the leg. Some of them were entirely separated from others ; some in close proximity at their bases, and some had coalesced into one common mass, especially in the neighborhood of the first original tubercle. This aggression of tubercles covered a surface nearly equal to the palm of my hand ; and was elevated at some points one inch above the integument. Before any topical remedies had been applied, excepting the most simple, large sloughs had been cast off from this tuberculoid growth ; and thus a cavity had been produced, one inch in length, one third of an inch wide, and extending beneath the base of the tubercles into the subjacent integument. There was no purulent or serous discharge from this deep opening ; and the patient stated that there never had been. I learnt from the medical attendant that he had sprinkled bichloride of mercury upon portions of this large group of tubercles for the purpose of producing suppuration—an event which did not take place. He also stated that he had, with the same end in view, applied a solution of nitrate of silver, ʒiii. to ʒi., but that no suppuration had been produced. The patient stated that from the time these local means were used, the limb became more painful and the disease advanced with greater rapidity than before.

The largest isolated tubercle was imbedded in the skin just above the inner malleolus. It was more than an inch in diameter, and elevated half an inch. It had acquired this growth in about three months. The integument of the outer portion of the leg was at this date nearly free from tubercles and papulæ. The most minute specimens of the latter could be felt in the substance of the skin before they had scarcely risen above its surface. They were perfectly hard at this stage of their development, and of a bright red color. On the summit of them the intensity of the red tint was a little obscured, as if the cuticle had been thickened or partially detached from the derma. By pressing them with the point of the finger, the color disappeared, and on the removal of the pressure it was quickly restored.

The hairs had fallen out from the whole integument of the limb excepting an irregular islet or patch, about five inches in length and from two to two and a half inches in breadth, on the outer aspect of the lower part of the thigh and the upper part of the leg. Upon this district of skin most of the hairs were firmly retained in their sheaths until the patient died, although in other respects it was the seat of the same morbid changes that were displayed in its vicinity. All the follicles from which the hairs had escaped were congested just sufficiently to attract attention ; and by drawing the finger over the skin many of them felt distinctly hard and solid ; in others, the diseased action had been too feeble to produce such a condition, except to a very slight degree.

Generally speaking, the tubercles were from one fourth to one third of an inch in diameter when at their full development. A few speci-

mens, however, were three fourths of an inch in diameter and half an inch above the level of the skin. They were of a dark red or purplish color, soft and elastic to the touch, and required for their maturity from eight to twelve weeks. Some of them, after they had ceased to increase in height, continued to augment by peripheral growth at the base.

One papule appeared upon the very end of the great toe. In ten days it grew as large as twice a mustard seed, after which it began to diminish, and in five or six days more was gone.*

Oct. 20, 1855.—Patient reports that there is a constant dripping of watery fluid, occasionally tinged with blood, from the deep cavity already spoken of as having been produced by the sloughing of the large tuberculoid mass; and the mass itself is flattening down and diminishing in size. No abatement of swelling or pain in the limb.

[Putrefaction, decomposition and wasting away of the tubercles, attended with a peculiar mawkish odor, slowly followed, attended with diminished exudation. The larger masses required from 8 to 10 weeks for their obliteration.]

The quantity of pus elaborated during the three months of my attendance upon the case was certainly microscopic; and ulceration, in the ordinary use of the word, did not take place. This fact, in connection with erythema tuberculatum, is mentioned by Prof. Wilson (p. 142).

Another fact to be mentioned in this connection is the condition of the epidermis. On the 10th of November the integument of the leg began to assume a dark color, as if it had been stained with a solution of nitrate of silver, although none had been used for forty days. The color continued to deepen from day to day until it became nearly black; the cuticle remained quite adherent after it had acquired its darkest hue; it could, however, be detached from the derma in small lamellæ or flakes as the parts were washed from time to time in chlorinated water. When dry, it was as thick as very stout writing-paper, and was very brittle. Under the microscope it appeared to be entirely disorganized, except where its under surface was attached to the cutis. Here a few epidermic scales were found in a normal state. On several occasions I examined the tissue now under consideration, and always found the above named appearances. The cuticle cracked in all directions and afterwards exfoliated,—but was reproduced in a few days, and thus the leg looked as if covered with black scales.

Tubercles continued to be evolved, one after another, in pretty rapid succession, until not only one leg, but a large part of the integument of the thigh, was covered with them.

* The anatomical distribution of the vessels of the part affords an explanation of this phenomenon. A single arterial twig is divided so as to supply quite a number (twenty or thirty) of the cutaneous papillary loops with blood, which is afterwards poured into one common venous ramuscule. When these vessels, as in cases of impeded circulation, are abnormally distended with blood, the entire group of congested papillæ will present the appearance of a single minute red point; and if the disturbance of the circulation extends to the contiguous papillary groups, the red spot will be greater or less according to the number of papillæ involved in the congestion. Vide Wedl's Pathological Histology, p. 208.

Three weeks immediately preceding death, all the tubercles then existing, became very much flattened, and formed a striking contrast to the bold outlines which they presented at the time the artist was employed to take drawings of them (Oct. 11th). On and after the 22d of December, cerebral symptoms were present. Patient ceased to recognize her friends except now and then; was rather stupid, although she could be roused so as to speak a few words; no paralysis of the vocal organs; no complaint of pain or suffering; said she could see scarcely any, and it seemed to her as if it was night all the time; pupils much dilated. I frequently asked her if she knew me; she would reply in the affirmative, but almost always gave the wrong name. The first thought I had that any cerebral affection had set in, was suggested by a singularly vacant stare which she exhibited—as if her vision were imperfect.

At the *post-mortem* examination, five or six of the tubercles were about one fourth of an inch above the skin, while nearly all the rest had so far disappeared as to be scarcely perceptible above the surface, and gave to it a mere knobby or rough aspect.

In regard to treatment, I can only say it was eminently simple. From the beginning it was but too evident that nothing could be done to stay the progress of the malady; and the only course we could pursue was to study the comfort of the patient as far as possible, and to see that no injury was done by the interference of quacks and other officious persons.

The diseased limb was the only part we were allowed to examine after the death of the patient. Some of the *post-mortem* appearances have already been spoken of. *Above the knee* the skin was of a dirty livid color. Scarcely a trace of tubercles was to be seen. The only mark which indicated the spots where they had existed, consisted in the peculiar shrivelled or collapsed condition of the cuticle, from beneath which the tubercles had disappeared a few days before death. The integument of this portion of the limb was thickened to a moderate degree—say from a line to a line and a half.

Below the knee, the skin had a very dark reddish brown color; or a deep brown with a purplish tint. So far as relates to the mere color of this portion of the limb, a very tolerable representation of it may be seen in the London edition of Bateman's Delineations of Cutaneous Diseases, Plate xxxi.—*Boston Med. and Surg. Journ.*

On the most favorable position for practising Artificial Respiration in cases of Asphyxia. (*Extract from a Letter of Marshall Hall to M. Flourens.*)

I am at present very much engaged in researches upon asphyxia. I believe I have established the advantage of the prone position when it is desired to practice artificial respiration. If the subject reposes upon the back, the tongue falls upon the epiglottis, which is carried back upon and closes the glottis; liquids that may be in the mouth or rise into it from the stomach, obstruct the same passage.

Everything, however, is changed by reversing the position and placing the subject upon his face; the tongue drops forward dragging after it

the epiglottis, the glottis opens and the air is allowed to enter freely in inspiration ; liquids in the back of the mouth flow out—thus allowing efforts to excite respiration to be more efficacious in the latter position.

I will transmit my labor to you when I shall deem it worthy.—*Nashville Journal, from Gaz. Med. de Paris,* Dec. 8th, 1855.

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1. *Experimental Researches applied to Physiology and Pathology.* By E. BROWN-SÈQUARD, M. D. Pp. 124. New York. 1853.
2. *Recherches Expérimentales sur la transmission croisée des impressions sensitives dans la moelle épinière.* Par le Docteur E. BROWN-SÈQUARD. Pp. 19. Paris. 1855.
3. *Propriétés et Fonctions de la Moelle Epiniére.* Rapport sur quelques Expérience de M. BROWN-SÈQUARD. Par M. PAUL BROCA. Pp. 66. Richmond (U. S.) 1855. Pb 35. 1855
4. *Experimental and Clinical Researches on the Physiology and Pathology of the Spinal Cord, and some other parts of the Nervous Centres.* By E. BROWN-SÈQUARD. Pp. 66. Richmond, (U. S.) 1855.
5. *Des Phénomenes de Contraction Musculaire observés chez des individus qui ont succombé à la suite du choléra ou de la fièvre jaune.* Thèse, par le Dr. GEORGE HENRY BRANDT. Pp. 43. Paris. 1855.

Startling results have followed the vivisections performed by M. Brown-Séquard, in respect of the Physiology of the Spinal Cord; and it is to these, and to the support which his conclusions derive from pathological observations, that we would at present direct our readers' attention.

It has long been a matter of belief that, while the anterior columns of the spinal cord conducted voluntary motor influences downwards to the muscles on their own side of the body, the posterior columns and part of the lateral were concerned in carrying upwards sensorial nervous impressions also from their own side. From the experiments of M. Brown-Séquard dates a new era in the physiology of the spinal cord; and we will endeavor, as briefly as we can, to point out what he has proved by careful and repeated sections in various ways, of the spinal cord, in a variety of animals; sections made in the presence of numerous distinguished physiologists, who were on the alert to detect fallacy, and who have reported most favorably on the correctness of the conclusions drawn.

Results of lateral section of the spinal cord.—This section, made so as to divide the whole of one half of the cord (*i. e.*, one anterior, lateral and posterior column) shows that the *nervous fibres which conduct sensory impressions cross or decussate all along in the spinal cord.* Hence it happens that, when a section of this kind is made, sensibility is lost on the *opposite* side, below the section; while it is not lost, but in fact is exaggerated, on the same side as the section, which only exhibits the well-known paralysis of motion.

The impressions on the left side of the body then are transmitted (mostly) by the right side of the spinal cord, and *vice versa*.

When a longitudinal section is made along the median line of the cord, at the part giving nerves to the lower extremities, the decussating fibres of both sides are necessarily divided, and sensory paralysis affects both lower extremities, while power of voluntary motion remains. A very curious result has been further observed in the instance of animals which have undergone the lateral section, namely, that they have become subject to a convulsive affection resembling epilepsy, but differing from it in the evident absence of loss of consciousness.

Section of a lateral half of the *medulla oblongata* gives, as regards sensibility, the same results as section of a lateral half of the spinal cord.

With respect to the seat of the decussation of the *voluntary motor fibres*, M. Brown-Séquard holds the opinion that in man, while it cannot be maintained that they *all* decussate in the medulla oblongata, where the fibres of the lateral columns cross each other to form the anterior pyramids, yet that the number of these fibres which do not decussate there is certainly small.

In the fourth work on the list at the head of this article, the correspondence of these views with pathological observations is most clearly established. "According to the seat of an alteration in the cerebro-spinal axis, producing a paralysis, there are three different kinds of paralytic effects which may exist: *a*. The alteration being in any part of the encephalon, except the inferior part of the medulla oblongata,—the paralysis of voluntary movement and of sensibility, exists in the side of the body opposite to the side of the disease. *b*. The alteration occupying an entire lateral half of the inferior portion of the medulla oblongata, at the level of the decussation of the pyramids,—the paralysis of voluntary movement exists on both sides of the body, but incomplete, and the paralysis of sensibility only on one side, and it is opposite to the side of the disease. *c*. The alteration occupying the entire thickness of a portion of a lateral half of the spinal cord,—the parts of the body situated behind it, on the same side, are paralyzed of voluntary movement, and the corresponding parts, on the other side are paralyzed of sensibility."—Pp. 30. But "as the sensitive nerve fibres, coming from one side of the body have to pass through the corresponding side of the spinal cord to go to the opposite side of the organ, it is easy to understand that an alteration occupying the entire thickness of the cord, is able to produce a paralysis of sensibility, together with a paralysis of movement in the same side of the body."—Pp. 32.

In explanation of certain pathological difficulties in connexion with crossed paralysis, our author says: "That it seems that, in some men, the sensitive and voluntary motor nerve fibres do not decussate at their usual place, and that, in consequence, some rare cases may exist in which an alteration in one side of the pons Varolii or of the medulla oblongata, will produce paralysis of the same side of the body.—Pp. 66.

Results of experiments on the posterior columns of the spinal cord.—In referring to these, we will endeavor to follow the order of the experiments recorded by M. Broca, as made in the presence of himself and other members of the Société de Biologie, by M. Brown-Séquard. *Section of the posterior columns* gives rise to pain and convulsive movements. Sensibility in the parts below the section *still remains*, and hence it is to be concluded, that "these columns are not indispensable to the transmission of sensory impressions;"—in fact, *hyper-æsthesia* of the lower limbs followed the section made in the lumbar region. On examining the sensibility of the divided portions of the columns themselves, it was found that while the cephalic portion was sensitive, the caudal segment was much more so—a fact which reverses all our ideas of the *direction of the nervous currents.* He found, also, that the grey matter of the cord was insensible, although, as will be seen, it is the true conductor of sensibility, which, together with power of motion, disappeared on its section in the parts below, even though the whole of the anterior columns, and about a third of the lateral columns, were left entire. In experiments again where all of the cord except the posterior columns, was divided, sensibility and power of motion disappeared in the parts below.

The hyper-æsthesia, once established in the hinder part of the body by section of the posterior columns, remains during the lifetime of the animal; and both this and the fact of sensibility of the caudal segment of these columns remaining and being excessive, are shown to be only explicable on the view that there are descending as well as ascending fibres in these columns, and that the latter are the more numerous. In fact, it would appear, from experiments made to ascertain the point, that these descending fibres run down a very considerable distance before they communicate with the grey matter which is to conduct the impressions they transmit to the sensorium. Moreover, it appears that the restiform bodies which have hitherto been regarded as transmitting impressions upwards, consist of fibres *all* of which conduct downwards. "At no epoch, perhaps, has the physiology of the nervous system been overturned by a revolution more radical or more rapid. Yesterday it was an harmonious whole, formed of undoubted propositions, ingenious explanations, and seductive theories—to-day it is a chaos. It was then a beautiful science, of which the nineteenth century was proud, and now it is a mass of ruins."—*From a Review in the London Med. Times and Gazette.*

A warm controversy is now going on in the London Lancet between Dr. Henry Bennett and Dr. W. Tyler Smith, regarding the existence of ulceration of the uterine neck. It commenced, by Dr. Bennett affirming that experience had entirely changed Dr. Smith's views upon the ulcerative nature of abrasions and excoriations of the cervix. In reply, Dr. Smith denies that he has changed his opinions, and states that, as regards the origin, pathological importance and the treatment of the

granular state of the os uteri, he is still as much at issue with Dr. Bennett as he ever was.

The following remarks by Dr. Smith, upon the action of potassa fusa and the actual cautery, will be found interesting.

"In my experience of the results of caustic, as used by other practitioners, I have seen one or both lips of the os uteri entirely destroyed. I have seen the stump of the anterior portion of the cervix form adhesions to the anterior wall of the vagina, or the posterior lip agglutinated to the rectum, menstruation being performed with difficulty, sterility being produced, and perhaps fortunately, inasmuch as in the event of pregnancy serious lacerations must have occurred during parturition. I have known pelvic cellulitis and pelvic abscess to occur from the use of caustic potash. Cases are on record, in which perforation of the recto-vaginal cul de sac and fatal peritonitis have occurred from the same cause. I have seen cases of incipient cancer in which the sufferers had been impatient under the use of soothing measures, and had been subjected to cauterization, converted into open cancer, progressing rapidly to a fatal termination. I have known nymphomania, acute metritis, aggravated hysteria, and many weeks of pain and misery ensue upon their use. I have seen a case in which the os and cervix uteri had been destroyed by cauterization, and pregnancy occurring, the lower part of the uterus was converted into an open slough, there being no cervix to develop. The progress of pregnancy was impossible, and the patient aborted in two successive pregnancies. I have seen the os uteri destroyed in a woman dying of phthisis. At this time I have an out-patient at St. Mary's Hospital, to whom the following history belongs:

L. F—— became an out-patient of St. Mary's Hospital at the end February, 1856. She is forty-eight years of age, and has had four children. Nine years ago, she became a patient in a public institution, to which she applied on account of leucorrhœa. She remained under treatment two years, during the whole of which time strong caustics were applied at intervals. In June, 1847, the monthly periods suddenly ceased, and she has never menstruated since. Up to that time she had been regular. She subsequently became a widow. Since the stoppage occurred, she has not been free from pain in the back, and she looks in miserable health, the result, as she declares, of constant pain. There is a good deal of vaginal discharge.

On making a digital examination, the vagina was found to be a mere cæcal tube or cul de sac, not the slightest trace of the os or vaginal portion of the cervix uteri could be felt. On examining with the speculum, a cicatrix was seen at the point at which the canal of the cervix, must have closed, but it was impossible to pass the smallest probe. It appeared as if the whole of the canal of the remaining portion of the cervix had been obliterated. I happened to have at the same time under treatment a case in which sloughing of the os and cervix, followed by occlusion of the uterine canal, had occurred after an instrumental labor. The appearances presented by the two cases were very similar, except that much more of the uterus had disappeared in the case

in which the infibulation and mutilation depended upon cauterization. The principle I would contend for in the treatment of uterine disease is a very simple one. It is that *no mutilation* should be practised; and cauterization by the white iron or by potassa is mutilation. These agents cannot be used in women during the child-bearing era without mutilating and destroying, more or less, portions of an organ which may be required for the purposes of menstruation, gestation, and parturition. If Dr. Bennett's method of practice has been adopted and carried out to the extent he asserts, and if the cases I have met with are seen by others in a like proportion, there must at the present time be, in this country, hundreds of women with the os and cervix uteri mutilated. I hold that in such disorders as the hypertrophy, ulceration, and induration of Dr. Bennett, the actual cautery, or caustic potash, which he tells us is the same thing, only that the use of caustic potash is unattended by the fizzing, smoke, and smell of the burning uterus, under the white-hot iron, should never pass the ostium vaginæ. Dr. Bennett speaks of assimilating the treatment of diseases of the uterus to the surgical treatment of other organs. But what should we think of that surgery which treated the disorders of the nose, eye, or ears, by agents which risked the mutilation of these organs? The uterus is the organ in which, of all other organs in the human body, mutilation should be avoided."

To these strictures, Dr. Bennett answers as follows:—

"I have no hesitation whatever in stating, in the most peremptory and decided manner, that no cases of this description, which Dr. Tyler Smith may have seen either at St. Mary's or elsewhere, were or have been cases under my care, and I defy him to prove to the contrary. I have been now many years in practice, and hundreds of my patients, poor and rich, are disseminated throughout the length and breadth of the land, but not one of them bears the trace of either mutilation or destruction of the cervix uteri. I was the first, it is true, to introduce potassa c. calce as a surgical agent in the treatment of uterine disease to the profession in this country; but I have ever taught that it ought only to be used to modify morbid vitality, not to destroy diseased or hypertrophied tissues. This, indeed, is the principle I have constantly kept in view, and on which I have constantly laid the greatest stress with reference to the whole class of caustic agents.

This rule I may mention, however, has not been adhered to by all. Dr. Simpson, of Edinburgh, with his usual surgical perspicacity, saw at once the advantage to be derived in obstinate cases from so manageable a remedy as potassa fusa, and not only adopted it, but recommended it to be used for the purpose of actually destroying part of the diseased regions of the cervix uteri, (see his collected memoirs, vol. i., page 101.) I must say that I think, and have always thought, Dr. Simpson wrong in thus departing from the rules of conduct which I had laid down; and the paper that I read at the Medical Society (see THE LANCET, July, 1854) was principally written to discountenance such practice, and to bring again clearly forward my own more cautious treatment.

All this Dr. Tyler Smith knows as well as I do, and he has no right

to make me responsible for the ideas and practice of others or to endeavor to damage me by implying, as he evidently does in his "Observations," that I am responsible, either personally or by precept, for the disastrous results which he says he has observed. Knowing, as he must do, that it is Dr. Simpson, and not I, who advises hypertrophy of the cervix to be "destroyed" in some cases, he ought, both in his work and recent "Observations," to have attacked, not me, but Dr. Simpson himself, or at least those of his too-enthusiastic followers who may have perpetrated the misdeeds he justly enough condemns. I presume, however, he would rather have me for an antagonist than the powerful Edinburgh professor, than whom no one is better able to defend his views and practice. *London Lancet.*

Bronzed Skin and Disease of the Supra-Renal Capsules.

We extract the following remarks from Mr. Hutchinson's paper (London Med. Times and Gaz.) upon Bronzed Skin, based upon an analysis of 27 cases of the affection, all that have hitherto been brought to his notice. It will be remembered that Dr Addison first drew the attention of the profession to this condition, in connexion with organic disease of the supra-renal capsules :—

Symptoms attending Diseases of the Supra-Renal Capsules.

1. *Change of color of the skin.*—The term "bronzing" probably conveys as good an idea of the character of the appearance assumed by the skin in this disease as could well be given. It resembles stikingly the color of a bronzed statue from which the gloss has been rubbed off. Pressure has no effect in causing its diminution. It seems as a rule to commence first in patches with ill-defined borders, on those parts most exposed to the sun and to friction, the neck, the back of the hands, the fronts of the thighs, the arms, etc. Around the nipple, and in other parts where pigment naturally abounds, it is generally well-marked, while others, possessing little or no pigment originally, as the palms of the hands, the ungual matrices, etc., remain as pale as ever. This tendency to show itself in patches, is strongly in support of the belief that the change is really one of deposit of pigment; which derives further confirmation from the circumstance, that in not a few cases the punctate, or even patchy deposit of black matter, was observed in the mucous membrane of the mouth, and in the serous investment of the abdominal viscera. The conjunctiva usually remains pale and pearly, a condition which well distinguishes true bronzing from the various states of jaundice. The changed color of skin, although most important for purposes of diagnosis, is probably of very minor consequence among the other departures from health which attend renal capsular disease.

2. *Debility.*—Next to bronzing of the integument the extreme and peculiar feebleness manifested appears to be the most striking of the symptoms. Without any evidence of thoracic disease, without any great loss of flesh, the patient becomes liable to faintings, loses energy,

is unable to exert either body or mind, and, in short, appears to be on the point of death from sheer weakness.

3. *Emanciation.*—Flabbiness of the solids rather than actual wasting is characteristic of the condition and seems true of the majority of cases.

4. *Anæmia.*—In almost all cases, there would seem to have been present great depravation of the colored constituents of the blood, as manifested by the pallor of those parts not involved in the bronzing, the general flabbiness of the muscles, the pearly state of the conjunctiva, etc.

5. *The Pulse.*—With a few exceptions, in which it became rapid, the pulse has generally been of but average frequency, and peculiar only in its extreme softness and compressibility.

6. *The tongue.*—It does not appear that any state of the tongue other than that common to most conditions of debility has been observed in connexion with this disease.

7. *Dyspepsia.*—In almost all cases prior to death, and in many for protracted periods, great irritability of the stomach was present. In most there was loss of appetite, more or less persistent nausea, and occasional vomiting, with pain and sense of sinking at the epigastrium. In the majority, it would seem that the bowels have been costive rather than otherwise, while, in a few, attacks of diarrhœa had occurred. In several instances the patients had been liable to "biliousness." Much more detailed observations as to the symptoms of indigestion present are desirable.

8. *The Urine.*—The urine was tested for albumen in many of the cases, and in some for sugar; but in no instance was any important departure from its normal constitution observed.

9. *Lumbar Pain.*—Aching, more or less severe, in the back or loins, was a symptom present in a considerable proportion of the cases. In two or three of these there was, however, disease of the vertebræ, by which it might have been occasioned; and the evidence respecting it is not such as to induce us to attach much importance to its signification.

10. *Nervous symptoms, convulsions, etc.*—Symptoms referable to disorder of the cerebro-spinal functions occurred in several of the cases. In three, epileptiform convulsions preceded death. In one, failure of memory, and remarkable change in temper, was observed; and in a second, numbness of the fingers, legs, and the tip of the tongue, had been present. In one, the man had suffered from tic douloureux.

11. *Odor of the Body* —In two cases, both under care at the Brighton Hospital, it was noticed that a peculiarly disagreeable odor was exhaled from the patient's body. In one this was present for a few weeks, and in the other only for a few days prior to death. The phenomenon is not mentioned in the reports of any other case in the series, and Dr. Addison informs us that it was not noticed in any case under his observation.

Mode of Death.—Speaking generally, we may say that the phenomena attending death are those of utter prostration of the vital powers, not unfrequently complicated by disturbance of the nervous functions.

Diagnosis.—The combination of a bronzed state of the skin with

great systemic debility may be held indicative of disease of the supra-renal capsules; and the more marked these conditions are, the more positively may the opinion be formed. [Jaundice, browning from exposure to the sun, Pityriasis versicolor, and the diffused brown muddiness of some other cachexiæ, may be mistaken for bronzing—a little care, however, will serve to distinguish them.] In the meantime, it should be borne in mind that in all cases in which bronzing is to be held as positively indicative of diseased capsules there ought to be traces of patching and mottling in some parts; and that in proportion as the tint is equally diffused over the whole body is the diagnosis doubtful.

Prognosis and Treatment.—We have as yet no reason for believing that in cases of true bronzing of the skin, the Physician can do other than give the most unfavorable prognosis. No recovery has yet been recorded, nor, indeed, has even temporary improvement under treatment been very marked in any case. After such an avowal it may, perhaps, seem superfluous to speak of treatment, since in our search for principles to guide us in it, we can avail ourselves only of that very delusive light which pathology furnishes. There seems, however, reason for believing, that the morbid changes to which the supra-renal bodies are liable are most of them more or less closely allied to inflammation; and from this fact one might, perhaps, be justified in selecting remedies from the class of drugs known to possess influence over that process. The exhibition of a course of mercury (in very small doses), or the use of the iodide of potassium, the patient's strength being meanwhile supported by a nutritious but non-stimulating diet, would probably be the most rational practice which could be suggested for a case of bronzed skin. As the change in color is, however, only produced, in all probability, after the organic disease has considerably advanced, there would not, it is to be feared, be much to be hoped for in the way of restoration of function.

Morbid Anatomy.—The cases recorded show examples of the following conditions in the supra-renal bodies. A remarkable symmetry of disease appears to have existed in all excepting the cases of cancer.

1. Acute and recent inflammation ending in abscess (Case 17).

2. Atrophy with fibro-calcareous concretions. This condition appears to have been present in seven cases. In some of them cysts existed, and in several a fluid matter resembling pus was contained in the cysts, and bathed the solid fibro-calcareous concretions. These changes probably result from inflammation of chronic character. The complete disorganization of the viscus is usually effected, and in all the cases recorded both glands were involved (Cases 2, 4, 7, 12, 13, 14, and 16).

3. The conversion of the viscus into a sort of fibroid structure, with great enlargement and induration. This occurred in Cases 1 and 6, and in both all trace of healthy tissue was lost.

4. The deposit of tubercle. In three instances (Cases 3, 5, and 9,) masses of deposit resembling tubercle were observed, and, coincidently, great enlargement of the organ and loss of normal texture. In two the deposit existed in both organs, and in one there was no tubercle in other viscera. It may be doubted whether the deposit is not really

more nearly allied to some form of fibrinous effusion, the result of inflammation, than to true tubercle.

5. *Cancer.*—In six cases (Cases 7, 8, 10, and 11), the deposit of cancer has been observed. In all it was secondary to the same disease in other organs. In four it affected but one organ, and in two both were involved. In but one was complete disorganization of both affected.

In the "Foreign Correspondence" of the same Journal is the following:

Three communications made last month, at the *Societé de Biologie*, by Dr. Brown-Séquard, seem to introduce some interesting particulars into our knowledge of the pathology of the supra-renal capsules. At first, Dr. Brown-Séquard mentioned that, more than four years ago, in 1851, (*Comptes Rendus de la Soc. de Biol.*, 1851, pp. 146, and *Gaz. Méd. de Paris*, 1852, pp. 73,) he had reported the results of many experiments, proving that, after certain injuries to the spinal cord in animals, the supra-renal capsules always become hypertrophied, after a few months. If the animals are killed a few days after the injury to the spinal cord, the supra-renal capsules are found in a state of hyperæmia, and sometimes they contain a clot of blood in their medullary substance. If the animal lives two or three months, or much more, after the injury, these organs are found to be twice or three times as large as in their normal state. The part which then becomes hypertrophied is the medullary substance. Since the year 1851, Dr. Brown Séquard has had the oportunity of opening more than a hundred animals, upon which he had severely injured the spinal cord, and, in all these cases, he has found the supra-renal capsules in a state of congestion when the injury was recent, and hypertrophied when it had been afflicted many months before.

These facts seem to establish positively the existence of an influence of the spinal cord on the blood-vessels, and on the nutrition of the supra-renal capsules.

In the ensuing No. of the same it is stated:

In a recent communication to the *Societe de Biologié*, Dr. Brown-Séquard has almost completed the exposition of the results of his researches upon the physiology and pathology of the supra-renal capsules. He has found that the extirpation of the two capsules in dogs, cats, rabbits, and guinea-pigs is a cause of very rapid death. In rabbits the average duration of life after this operation is 9 hours; out of 25 animals of this species, only 1 survived 13 hours, and almost all lived 8, 9, or 10 hours only. In adult dogs and cats the average length of life has been 14 hours, and the greatest period has been 17 hours. In newly-born kittens life lasted, in one case 38 hours, in a second 49. After the extirpation of only one of the supra-renal capsules, life lasted 15 or 16 hours, on an average, in rabbits and guinea-pigs, and 27 hours, on an average, in dogs and cats.—*Med. Times and Gazette.*

Abstract of Meteorological Observations for March, 1856, made at Philadelphia, Pa. Latitude 39° 57′ 28″ N., Longitude 75° 10″ 40′ W. from Greenwich. By PROF. JAMES A. KIRKPATRICK.

1856. March.	Barometer. Daily Mean	Barometer. Mean Daily Range.	Thermom. Daily Mean	Thermom. Mean Daily Range	Rel. Humid. 2 P.M.	Force of Vapor 2 P.M.	Dew Point 2 P.M.	Rain & Melted Snow.	Prevailing Winds.	Remarks.
	Inches.	Inches.	Deg.	Deg.	Hunds.	Inches.	Deg.	Inches.	Points.	
1	29.886	.222	32.8	2.2	69	.142	26.2	1.200	(Var.)	Morning *fog;* afternoon and evening *snow;* night *rain.*
2	29.354	.532	37.3	4.5	52	.150	27.5		W.	Morning *rain*; afternoon cloudy; evening clear. *Barometer lowest* 29.234.
3	29.922	.569	29.0	8.3	70	.132	24.6		W.	Morning and evening clear; afternoon cloudy.
4	29.877	.255	37.7	10.7	69	.214	36.2		SW.	Clear; evening *rain* for about five minutes.
5	29.863	.124	29.3	9.7	60	.113	21.0		W.	Clear.
6	29.599	.264	33.2	6.2	59	.163	29.5		SW.	Morning and afternoon cloudy; 5½, P. M., a few flakes of *snow;* ev'n. clear.
7	29.847	.248	27.3	8.2	51	.095	17.2		W.	Clear.
8	29.722	.175	32.8	8.2	37	.098	17.9		(Var.)	Clear.
9	29.918	.196	15.2	18.0	52	.052	4.0	0.037	NW.	Cloudy; evening and night *snow.*
10	29.931	.041	11.5	4.0	47	.041	-1.2		W.	Morning and evening clear; afternoon cloudy. *Thermometer lowest* 4°.
11	29.692	.239	26.8	15.3	62	.127	23.7		(Var.)	Cloudy.
12	29.642	.136	29.3	3.2	61	.129	22.4		WSW.	Clear.
13	29.837	.195	31.5	2.2	63	.144	26.6		W.	Morning clear; afternoon and evening cloudy.
14	29.901	.064	33.2	1.7	46	.110	20.4		NW.	Clear.
15	29.916	.017	37.0	4.2	59	.163	29.5		W.	Morning a light fall of *snow;* evening clear.
16	29.915	.028	33.2	3.8	95	.201	34.6	0.013	W.	Morning and afternoon *snow*; evening clear.
17	30.022	.107	35.0	4.2	42	.112	20.8		W.	Clear.
18	30.045	.043	39.3	4.3	42	.142	26.2		NW.	Cloudy.
19	29.720	.325	35.5	5.2	81	.194	33.7	0 491	(Var.)	Morning *snow* about 6 inches deep, drizzling occasionally; evening clear.
20	29.634	.086	41.2	6.7	71	.246	39.8		SW.	Cloudy; a few drops of *rain* at 6, P. M. *Thermometer highest* 49°.
21	29.600	.045	42.7	2.8	63	.212	36.0		(Var.)	Cloudy. *Delaware River open, ice floating in large cakes.*
22	29.643	.043	40.7	2.0	50	.157	28.6		NE.	Cloudy.
23	29.710	.067	41.3	1.3	41	.133	24.7		(Var.)	Morning and afternoon clear; evening cloudy. [3¼ to 8, P.M., *rain.*]
24	29.538	.173	40.0	4.7	86	.214	36.2	0·293	SW.	11¼, A. M., *rain;* 2, P. M., *hail,* white, and averaging ¼ inch in diameter;
25	29.658	.179	40.2	2.5	59	.163	29.5		NW.	Cloudy.
26	29.673	.067	39.5	2.0	46	.137	25.4		W.	Clear.
27	29.541	.132	35.7	3.8	46	.110	20.4		NW.	Morning and evening clear; afternoon cloudy.
28	29.619	.080	29.3	6.3	49	.089	15.8	0.005	NW.	Morning *snow:* afternoon and evening cloudy.
29	29.751	.130	34.0	4.7	38	.093	16.9		W.	Clear.
30	29.893	.142	32.0	2.0	45	.163	19.0		W.	Clear.
31	30.080	.187	30.5	1.8	61	.129	24.0		NW.	Morning and afternoon cloudy; evening clear. *Barometer highest* 30.161.
Means for Mar., 1856	29.773	.165	33.4	5.3	57	.139	24.4	2·039	N. 80° 47′ W. 54-100	
Means for Mar., 5 yrs	29.827	.169	39.9	5.5	54	.163	31.0	2.475	N. 69° 11′ W. 35-100.	

The Monthly Range of the Mercury in the Barometer was 0.928 of an inch, and in the Thermometer 45°.